DBA THESIS

Public Preferences on the Trade-off Between Privacy and Surveillance in Public Spaces

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Student No: UP831511

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“Whilst registered as a candidate for the above degree, I have not been registered for any other research award. The results and conclusions embodied in this thesis are the work of the named candidate and have not been submitted for any other academic award”.

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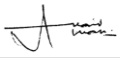
Signed *(PGRS)*:		**Date:** April 01,2020

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To my late Father Nasir Ali Khan and
Mother Shamim Akhtar

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Abstract

This research focuses upon public preferences on the trade-off between surveillance and privacy in public spaces in the context of Pakistan. Mass surveillance in Pakistan has begun from Lahore, the second largest city of the country, by installing approximately 8000 cameras with intelligent features primarily to deal with multiple security and public safety issues. Punjab Safe Cities Authority is a government organisation working under Punjab Police responsible for establishment and functioning of Punjab Police integrated command, control and communication centers in Punjab. However, public was not consulted prior to enforcement of this innovative technology-oriented project in Lahore. This research has strived to fill this gap in governance of security to explore the public preference of people in two cities (Multan and Rawalpindi) of the Punjab province through quantitative research and application of discrete choice stated preferences model.

This research is significant because of the impact assessment of Lahore Safe City project as it was designed, implemented and operationalized. A new governance framework for data protection and public safety was adopted for the first time in Pakistan and transformation of an old Policing model to an advanced collaborative digital platform was studied in real time to draw some conclusions.

Results of this research are important for the practice and public policy alike. From practical perspective, this research provided guidelines for taking on such innovative projects in countries like Pakistan and how to manage implementation of change in organisations like Punjab Police. From public policy perspective, it has initiated the debate of privacy as a fundamental human right which has strategic implications in the legal framework of the country by a possible amendment in the constitution of Pakistan. People have supported the installation of surveillance cameras for security however, their willingness to pay a security fee for this apparatus has some limitations. The research leads to recommendations that such public policy interventions should be designed after due consultations with the public for democratic governance. It also suggests that there should be a legal framework for protection of privacy rights of the people subjected to surveillance and a national regulatory mechanism should be adopted to strike a balance between application of mass surveillance systems and protection of privacy rights in the country in order to avoid technical and public policy risks.

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Glossary

AI	Artificial Intelligence
ANPR	Automated Number Plate Recognition
CAD	Computer Aided Dispatch
CCTV	Closed Circuit Television Cameras
CONOPS	Concept of Operations
DP3	Data and Privacy Protection Procedures
DCC	Dispatch Call Centre
DCSPM	Discrete Choice Stated Preferences Method
ECC	Emergency Call Centre
EDR	Electronic Data Regulations
ETVMS	Electronic Traffic Violations Management System
FCL	Facial Control List
GIS	Geographical Information System
IPNV	Internet Protocol Network Video
ICCPR	International Convent on Civil and Political Rights
ICT	Information, Computer and Technology
ITS	Intelligent Traffic System
JTMS	Journey Time Management System
LTE-A	Long Term Evolution – Advanced
MMC	Media Monitoring Centre
MWTP	Marginal Willing To Pay
NISP -1	National Internal Security Policy 2014-2018
OMC	Operations Monitoring Centre
PCO	Police Communication Officer
PICTS	Police Intelligent Counter Terrorism Surveillance System
PIERS	Police Integrated Emergency Response System
PTMS	Police Intelligent Traffic Management System
PPIC3	Punjab Police Integrated Command, Control and Communication Centre
PPRA	Punjab Procurement Regulation Authority

PSCA	Punjab Safe Cities Authority
PRU	Police Response Unit
PUCAR - 15	Police Unified Communication and Response @ 15
RLMS	Red Light Management System
TOP	Technology Oriented Policing
UDHR	Universal Declaration of Human Rights
VCL	Vehicle Control List
VMS	Varying Message System

Chapter 1
Introduction

1.1. Setting the scene - First National Internal Security Policy of Pakistan

Pakistan has been a place of interest for world viewers since its creation in 1947 due to its geo strategic location and neighboring countries like China, India, Iran and Afghanistan. It remained an attractive place for world super powers USA and USSR in the 1950s soon after World War II in order to gain influence in the region. However, in recent times, it came under telescopic attention of the world super powers when the Afghan war started with Russia in 1979. Fighting in Afghanistan resulted in the spillover of more than three million Afghan refugees in North Western border areas of Pakistan (Anwar, 2013; Weinbaum, 1991) which also was, inter alia, going to change the internal political and security landscape of Pakistan in coming years (Matthew, 2016). In wake of these significant events it was expected that Pakistan will come up with a clear and stated policy to deal with the situation for the world audience (Adnan, 2006). It did not happen even when whole scenario changed in Afghanistan on 9/11 when America invaded Afghanistan after a resolution of United Nations 1368 (2001) (Pande, 2011). It was only on February 25, 2014 when USA was formally withdrawing its forces from Afghanistan that an elected democratic government of Pakistan approved and announced publicly it's first Internal Security Policy (NISP) for 2014-2018 despite many odds and resistance from multiple quarters (Ghani, 2019; Malik, 2018, 2018; Syed & Javed, 2017).

NISP-1, as it is called now, had set clear objectives and it was eagerly received in world capitals (Safi, 2014). It comprised of 53 contours which included hard and soft components for civil armed forces and civilian law enforcement agencies. NISP-1 was focused on civilian law enforcement apparatus with paramilitary and military forces as support forces in case of

large scale civil disturbances in peace times, a role enshrined in the Article 245 of the Constitution of Pakistan 1973 (NACTA, 2014). One of the key contour was capacity building of Provincial Police Services to combat traditional threats like crime, organized crimes etc and non-conventional crimes like terrorism, cybercrimes, chemical and biological attacks, cross border crimes etc. (MOI, 2014). In this first ever NISP-1, guidance for the provinces was limited to contours only and detailed plans were left with the wisdom and discretion of the provinces especially considering that after the 18th Constitutional Amendment in the Constitution. This was due to the fact that provinces were sensitive about their autonomy. Policing is in the provincial list of the subjects mentioned in the Constitution of Pakistan. NISP-1, gave a clarion call and paved the way for establishment of specialized Counter Terrorism departments in the provinces which are now working in all provinces at full scale. It also highlighted that provincial Police departments need to improve their existing set ups to deal with internal security matters comprehensively (Safi, 2014).

Provinces have taken numerous steps by adding additional resources in terms of manpower and logistics for improvement in service delivery of Police forces. As a result, new police units with specialized functions and at times with separate legislation were created in Punjab Police (MOI, 2014). Specialized forces and units were created in the Punjab Police with the help of government fundings of PKRs 477,772.40 million and financial input of provincial Police increased its funding from 2014 to 2018 (Finance Department, 2020).

In Khyber Pakhtunkhwa Police, focus was not only in specialization but a step was taken to amend the Police Order 2002 to Police Act 2017 through provincial legislatures focusing on providing Police leadership more autonomy in the overall governing structures. This was a major move to acquire the law making of Police Laws from federal government to the provincial level which paved the way for provincializing the Police laws - a

major departure since 1861 when legislation of Police laws was in the federal domain for uniformity and functioning across the federating units in Pakistan. Such an attempt was already made by Balochistan in 2012 but as it has a small Police force and jurisdiction of Police was limited to 5% of the total area of Balochistan, hence, it did not get the attention it deserved. It was an important development because role of Police was reversed in 95% of the areas of Balochistan reversing a positive trend of uniformity of criminal justice system in the country (Abbas, 2011; Tomkins, 2005). Under the new laws and the National Action Plan, in Khyber Pakhtunkhwa, special schools of Investigation and Intelligence were created with the help of public funding and with the assistance of foreign support including UNDP, DFID, USAID and European (Bahadar *et al.*, 2019; Syed & Sardar; Ullah, 2017). Sindh Police, Gilgit Baltistan Police and Islamabad Police were not lagging behind as similar actions were taken there too. Like many other positive developments undertaken under a democratic government, these steps were also not discussed or highlighted in the right vein by the Police in Pakistan (Abbas, 2011).

While focus in Khyber Pakhtunkhwa and Balochistan was on legal framework to regain control of the Police by the Police and bureaucracy respectively, role of technology was not very prominent in any of these provinces except Punjab which was leaping forward in “Technology Oriented Policing” (TOP) (Manning, 2008; Stenson, 1993). Term is used for the first time on October 4, 2015 in a feature for BBC Urdu and since then it is in use Khan (2015); (A. N. Khan, 2019) . It is inspired by a term used by Stesnson in 1993 in USA (Stenson, 1993). Some initiatives were taken at individual level to use various applications for operational purposes and digitalization of the police records. However, a comprehensive program was initiated in Punjab by the name of Punjab Safe Cities Authority in 2015 aimed at providing mass surveillance capabilities to the Police among other technology components including intelligent traffic management as well integrated emergency response

mechanisms through end to end information technology platforms. Under this project in Lahore, the capital of Punjab province, more than 8000 cameras are installed for mass surveillance of public places including highways, roads, educational institutions, public offices, banks, markets and recreational parks; (PSCA, 2019). Post 9/11, world has seen a mushroom growth of public security measures and installation of Closed Circuit Television (CCTV) cameras is a popular trend (Levi & Wall, 2004; Marks, 2010). According to House of Commons, Home Affairs Committee; only in UK there are 4.2 million CCTV cameras and these are used for multiple purposes including predicting crime and speaking to public. Out of these only 16% are owned by the public authorities and rest of 84% are privately owned cameras (Commons, 2007-08).

All major cities of the world including London, New York, Washington, Tokyo, Paris, Beijing and Dubai are following this trend. In Pakistan Karachi, Islamabad, Lahore and Kasur are latest entries into this list and this trend is being followed in all major cities of the country regardless of scale of coverage. This tendency to deploy CCTV cameras, and recently Internet Protocol Network Video (IPNV) Cameras, is increasing day by day not only in public sector but also in private sector due to threat perception and incidents of crime and terrorism in Pakistan (Ali *et al.*, 2017; Chowdhry *et al.*, 2013; Schneider, 2011).

1.2. Aims and Objectives

This research, primarily, aims to capture public preferences in urban centers about trade off between privacy and surveillance in public places. Government of the Punjab in Pakistan, had decided to expand the initiative of mass surveillance from one large urban center to nine additional urban centers which include Sheikhupura, Nankana Sahib, Dera Ghazi Khan, Bahawalpur, Multan, Faisalabad, Sargodha, Gujranwala and Rawalpindi. There is, however, no informed data available prior to taking this major step.

No consultations were made with the various segments of the public about this security inititiative. In the absence of this data and evidence, this public policy intervention may bring surprises during and after implementation as mass surveillance has numerous implications from the human rights, privacy and the legal perspective.

Cultural and demographic diversity of Pakistan makes electronic surveillance more problematic from criminal justice system development perspective (Abbas, 2011). If it is not perceived well then there might be a reaction against this major technological intervention in policing system by one or more stakeholders. Social and/or religious reasons may be cited to camouflage the real preferences of the people. Revealing public preferences for privacy and security is itself a challenge. This research was also conducted to elicit public preferences and willingness to pay for these types of security measures knowing the potential impact of such intervention on their privacy rights.

Secondary purpose of this research is to explore whether Punjab Police through Technology Oriented Policing (TOP) in Lahore, the second largest urban center in Pakistan, will be able to improve quality of service for the people. It is also important to analyse this change management along with the processes and procedures adopted during the implementation of Lahore Safe City Project and to measure the early results of this endeavour and draw some lessons for the future.

1.3. Research Questions

Government of the Punjab in Pakistan has initiated a Punjab Police Integrated Command, Control and Communication Centre (PPIC3) Project in Lahore with cost estimate of USD 139.40 million (Hussain, 2017; Rana & Bhatti, 2018). This is the biggest investment in civilian security sector on a project by any government since inception of Pakistan. On supply side, it is a leap forward from paper based police management system in Pakistan to

modern and technology oriented policing (TOP) (Khan, 2015). In addition, the command structure change will be aimed at delegation of authority and decentralization at lower levels closer to field level and based upon scientific evidence collected through cameras and other sensors. There is a need to look at the demand side and assess public preferences and whether people are willing for this change. There will be serious concerns about balancing security and privacy options. According to a study conducted by RAND Europe, stated preference choice experiments were used to quantify the strength of preferences, including an estimation of citizens' willingness to pay for proposed initiatives related to security (Patil et al., 2014; Neil Robinson et al., 2010). Although this study conducted in 27 EU countries shows preferences of people for CCTV cameras but this needs to be tested in a different cultural and security environment like Pakistan (Zehnder, 2010). This research revolves around following questions:

I. What are the key features of this surveillance systems in Lahore? How this system was implemented?

II. How this transformation in policing took place in a place where there were no indigenous models of advanced policing? Are there some lessons learnt?

III. Was there any consideration of competing demands of security and privacy during implementation stage?

IV. How people will respond to installation of large number of CCTV cameras for surveillance of public spaces where no such system exists?

V. Will they be willing to pay for such a system and if yes, how much?

VI. Are there any cultural sensitivities for men or women about exposure to 24/7 CCTV cameras surveillance?

Will the people have any concerns about privacy rights? This question has many dimensions including legal, social and behavioral norms to religious practices (Sadowski & Pasquale, 2015; Stern, 2011).

1.4. Timing

It is imperative to research into this topic at this time due to the opportunity to tap demand side of the security interventions in a controlled environment. Public and private security providers conduct research to shape the public and private policies. Interactions of security and privacy concerns in Pakistani society needs indepth deliberations. Learning lessons from international practice and local experiments are necessary before spending public money on future projects. On the basis of this research it will be possible to tweak the design and implementation of current projects and revisit rationale of other projects coming in other cities. Lastly, capturing premises of the decision makers and implementers during this stage will act as a baseline for comparative analysis at later stages.

Further, for this research another focus will be the implementation process of PPIC3 Project and establishement of the Punjab Safe Cities Authority which was merely a piece of legislation in 2015. Study of this part was important in this time frame as this practice based research was conducted side by side in real time when the project was being implemented. Capturing these details and data would not have been possible later and other biases could have altered the results due to lapse of time.

1.5. Significance

In developing the Punjab Police Integrated Command, Control and Communication Centre (PPIC3), in order to achieve objectives of safe cities, the focus has been mainly on the supply side with limited attention to the demand side (e.g., to capture public preferences, cultural, religious and privacy issues). As highlighted by (Robinson, Potoglou, Kim, Burge, Warnes

& Richard.(2010), for this type of initiatives, there will be serious concerns about balancing security and privacy options (Neil Robinson *et al.*, 2010).

Determination of public preferences for trade-off between privacy and security in Punjab will help in shaping critical public policy decisions and even constitutional framework of the country where right of privacy has limited scope confined to home of citizens. This research will assess the impact of security related interventions at various levels from policy development to the service delivery level by guaging public response through empirical studies and surveys.

1.6. Contribution

Mapping public preferences about tradeoffs between security and privacy is useful for decision makers in the security sector in Pakistan and elsewhere for public participation in the affairs of the state (Dragu, 2011). Inclusivity and transparency in the security sector by taking on board the ultimate stakeholders promotes good governance. At policy level, this procedural study assesses peoples' willingness to contribute in monetary terms.

Results of this research will help in exploring determinants of an effective project implementation process in major urban centres like Lahore. It is also critical to gauge links between change management, challenges during execution, leadership style of complex projects and forecast about the impact of surveillance projects in a country like Pakistan.

The lessons learned from this study will help to shape the future policy initiatives in the public security and safety area. In addition, answer to research question will help to understand the governance model and priorities of the government of Punjab starting from the policy implementation to the stakeholders' engagement. Assessment of public preferences and the trade offs between surveillance and privacy in the public sector will draw attention toward attributes of good governance.

Above all, this research addresses unattended subject of privacy rights as an inalienable part of fundamental human rights in Pakistan, a subject which needs immediate attention while treading on the path of modernisation of police service in a democratic society.

In this research, after this first chapter, Chapter 2 gives the background and literature review about two key themes, privacy and surveillance and legal framework around these concepts in national and the international perspective. Chapter 3 deals with need assessment and scope of mass surveillance system in Lahore. Chapter 4 explains the actual system and how it is being used including its early impact on service delivery. Chapter 5 analyses how this system was built and how this mega change was implemented by the designers and project management team in the Pakistani context. Chapter 6 explains the processes of eliciting public preferences about privacy and surveillance and methodology of data collection for this research. Chapter 7 is presentation of data collected from cities of Rawalpindi and Multan and how each parameter is conceived by the participants of this research. Chapter 8 is analysis of this data through quantitative techniques and explains the policy options as a result of public preferences and trade off between privacy and surveillance at public places. The research concludes with an assessment of the public preferences and trade off in the light of legal and social environment of Pakistan which can be valid in other settings and a set of recommendations for policy makers. In this sequence, next chapter discusses concepts of Privacy, surveillance and laws related to these concepts in the western countries and in the Pakistani context.

Chapter 2

Literature Review: Privacy and Surveillance

The subject of privacy in Pakistan has not been fully discussed till recently (Terres, 2020). Privacy in public places is discussed in the newspaper and views of various authors are presented while discussing political rights and issues in Pakistan (S. Khan, 2019). Same is the case about video surveillance methods and implications of overt video surveillance by Punjab Police and Punjab Safe Cities Authority (PSCA), Lahore. Rapid developments in technology are bringing fundamental changes in surveillance methods and how it can potentially have an impact on privacy of its citizens (S. Khan, 2019).

In Pakistan, Punjab Safe Cities Authority is the custodian of the biggest databank collected through video surveillance using approximately 8000 cameras installed in District Lahore. PSCA has come up with legal processes to collect, preserve and disseminates this data with interested stakeholders in a lawful manner which needs more elaboration at national level and in the legislative framework. It is intended to discuss how privacy concerns of the public under surveillance are being addressed so far in this state-of-the-art project of government of the Punjab.

There is not much literature available about consequences of mass *Surveillance* and impact on *Privacy* rights as this is a new phenomenon in security apparatus in the Pakistani context. To understand the key terms used here, we will look into concepts of surveillance and privacy through literature review. Although there is debate in progress since some time in other advanced countries well before 21st century due to the increasing role of internet and technology, this concept is still new in Pakistan as government owned cameras have very recently been installed in public places through PSCA which is building and managing the PPIC3 Centre. There is a need to

discuss social and legal issues which may arise due to video surveillance at public place (Robinson & Potoglou, 2010; Warnes, 2010), for these types of initiatives, there will be a need to balance security requirements and privacy concerns and at times important trade off will be necessitated. Exploration of such issues will be important as this is a stated policy of other provincial governments in Pakistan to build safe cities projects and similar concerns can be raised in other provinces (The News, 2020).

2.1. Background

Installation of Close Circuit Televised (CCTV) cameras for surveillance and public safety is a popular trend for security of places, premises and persons in many countries especially in the post 9/11 world. In the same vein, Government of the Punjab in Pakistan has started a Punjab Police Integrated Command, Control and Communication Centre (PPIC3) Centre Programme in Lahore in 2016. Under this Programme more than 8000 cameras were deployed at various places of Lahore for counter terrorism surveillance and intelligent traffic management from a command and control center. On the supply side it is a leap forward from the existing policing system which had no elaborate information infrastructure in Pakistan for Technology Oriented Policing (TOP) (Khan, 2015). From supply side's perspective, it is claimed that through this surveillance project efficiency, effectiveness and responsiveness of Police services will improve in addition to decentralization and delegation of authority to ground level forces involved in Police operations (PPIC3, 2015).

There is no data available to confirm that before taking this major step, any concerns were raised or discussions were held about privacy implications for individuals by installation of the surveillance cameras and other measures. In other countries, if mass surveillance is not perceived well then there might be active or passive reaction against such major technological intervention in the policing system. In this case, however, it becomes more challenging

as there is no previous knowledge and legal framework available to regulate installation of CCTV Cameras as well as paucity of avenues for public to lodge any complaint about installation and use of surveillance apparatus by the public or private actors. Cultural and demographic diversity of Pakistan makes it more problematic to form any consensus on such steps from the criminal justice system development perspective (Abbas, 2009).

2.2. Privacy

Privacy is not a new concept. Historically, it is referred to in the Holy Qur'an, Bible, at the time of the Roman Empire and in ancient China. In historical terms, Aristotle bifurcated the family life from political and public sphere and discussed it under a different paradigm (Clayton, 2005). Family affairs were taken as private affairs because they were related to relatives in the confines of four walls while everything happening out of the home was constituted public discourse. In post enlightenment era, John Locke further classified the public and private goods based upon acquisition of goods through personal labor or collective effort (Locke, 1824; Locke & Nidditch, 1979). Subsequently, Mill J. S. presented that there should be a narrow area for government regulation and rest of the activities are private affairs of the people (Mill, 1892). In today's world it has a variety of interpretations. There is growing thought that relationships like friendship, trust and love are private and cannot flourish without protection of privacy. Some authors like Warren & Brandeis also take privacy as a right and information about individuals as privacy (Warren & Brandeis, 1890).

Privacy can be discussed in more than one way and different streams of literature have touched upon this concept separately. Some philosophical discussions are focused on definition of privacy. Alan Westin defines Privacy as: *"the desire of people to choose freely under what circumstances and to what extent they will expose themselves, their attitude and their behavior to others"* (Westin, 1970). Thomas Emerson states that privacy is *"based upon*

premises of individualism that the society exists to promote the worth and the dignity of the individual. . . . The right of privacy . . . is essentially the right not to participate in the collective life the right to shut out the community" (Emerson, 1970). To many, if information about a person is already available in the public domain e.g. in papers or in public records then he or she cannot claim that such information is private in nature. Generally, privacy includes but not limited to *"facts about a person's sexual preferences, drinking or drug habits, income, the state of his or her marriage and health"* (Parent, 2017).

Principle of protection of Privacy right of an individual restricts others to access a piece of information which has not been published or has appeared in any newspaper or public information by any other means including, but not limited to court proceedings or any public record. As compared to other writers, Parent categorically mentions this documented information out of privacy rights (Nissenbaum, 1998; Solove, 2012).

Raymond Wacks, in his effort to find out a precise definition of Privacy expounds that fundamental issue of privacy is the relationship between the individual and the society (Wacks, 1993). Protection of these rights of individuals is of paramount importance for writers like Ayn Rand who stated that the smallest minority on earth was the individual and protections of individual rights is very important for defenders of minority rights (Ayn Rand *et al.*, 1986). This clarity is essential to develop a society where structural and organizational development is based upon this premise that individuals' privacy rights are well respected while defining a social contract. The theory of Privacy helped in drawing the boundaries of social life (Nissenbaum, 1997; Westin, 1967). Parent and Wacks drew attention towards information itself rather than choices of the individuals (Schoeman, 1984). Tom Gerety, who was mindful of the ever changing boundaries of this concept, argued to limit the privacy rights to *"intimacies of personal identity"* only (Gerety, 1977).

Charles Fried philosophically defended the privacy rights because in his opinion it is a precondition that provides the context for nurturing trust among the human beings (Schoeman, 1984). He argued for controlling all the information about individuals, but from a pragmatic point of view he was convinced that it required a limited realm of privacy for the protection and development of relationships and legal implications. How to define the boundaries depends upon the cultural and conventional values of each society where other equally important social norms and legal obligation interact with rights of the individuals. Due to this interaction it is difficult to enlarge the scope of individual rights. Fried also mentioned that it is possible to narrow down this scope. He wrote, "*The important thing is that there should be some information which is protected*", i.e. to protect the relationships and intimacy, which need privacy (Nissenbaum, 1998).

Explaining the purposes of defining the privacy limits David Schoeman pointed that most of our acts and behavior is open to public scrutiny and accountability. Contrary to this, privacy is required to provide that space where individual's acts are not open for any judgment or public scrutiny which indirectly alters the behavior of an individual to be socially acceptable (Schoeman, 1984).There is a slight difference between Fried and Schoeman where latter opined that this private sphere may not be always determined by social convention. The views of these scholars though varying at points but they all agree on one fundamental point that for a healthy society people need privacy which assures them that their personal and intimate space is out of the telescopic surveillance of state or commercial actors and nurturance of their personal relationships is free from any kind of intrusiveness (Nissenbaum, 2004).

2.3. Privacy in Public

Over a period of time privacy theorists in philosophical and legal domains have debated over the inter-linkages between information about individuals

and privacy. It is considered that application of information about personal and intimate relationship does not apply in public places and any such act taking place out of private places, like four walls of the house or any in other premises, is no more private. It is not possible, from a legal point of view, to safeguard privacy rights in public sphere (Nissenbaum, 1998). The need arose to define the limits of privacy more precisely when not only physical limits but also limits of soft data and information were questioned in the courts (Dinev, 2014). Some authors have presented ideas to categorize the data collection for services and for surveillance with particular reference to smart cities (Van Zoonen, 2016).

Nissenbaum argues that meanings of public information are dramatically changed since application of information and communication technology (ICT) (Nissenbaum, 2004). A case in point can be surveillance through CCTV cameras where public places are focused for multiple reasons including security and public safety by various law enforcement agencies across the globe. However, this is not limited to security and public safety only. In the markets, jewelry shops, super stores, road check points and other public areas there are many commercial users of these cameras which are recording movements of the individuals. By facilitating surveillance through ICT, and changing the profiling, storage, dissemination and analysis of the same personal information for multiple users over an extended time frame, the dimensions of privacy are changed many folds. The information stored can be analyzed by name, vehicle number, identity card number, tax number, health insurance number and credit card number. Moreover, personal information i.e. color of eyes, fingerprints, facial features and skin color are also not only recorded but also used for commercial purposes. This information about individuals is neither limited to specific users nor confined to purposes. Rather, it can easily be transported and preserved for an extended period of time. The data about these movements and actions is used not only for security of commodities and/or for collection of revenues

but behaviour of these individuals are also recorded and used to analyse their choices and preferences which also have commercial value. Consequently, while considering the right of privacy in private spaces, it is important to assess the privacy rights in public sphere as well (Nissenbaum, 1998). This model is being challenged by authors who are trying to bifurcate the use of information and data from their purposes and reasons (Slobogin, 2002).

The concept of *privacy in public* needs elaboration in light of legal and philosophical terms also. Although it varies from one culture to another culture but even in a developed world some scholars have taken the view that all activities taking place in private arena are sensitive and sanctity of home cannot be violated. Argument of this school of thought is to keep the governmental authorities out of personal or private affairs and restrict their access. In this way, right of privacy is a justification and a method to prevent the intrusion of the government or regulators in personal affairs of individuals. Conversely, other group argues that public life is open to all and there is no bar on gathering information about any individual in a public place. Privacy criterion of personal limits at home does not apply to public places. If this analogy is accepted, then any facial recognition data collection or capturing the number plates of individuals' vehicles in the streets by the government authorities in whatsoever method will be lawful and justified as it does not impinge upon one's right of privacy of individuals as they are out of their sanctuaries and four walls of their homes.

This view is further supported in *United States v. Knotts (United States VS Knotts, 1982-1983)* case in which the Supreme Court gave verdict about application of the Fourth Amendment to tracking a car's movements with an electronic device. The Court decided that *"[a] person traveling in an automobile on public thoroughfares has no reasonable expectation of privacy in his movements from one place to another"* (Justia, 1983). Court concluded that monitoring of such automobile by electronic or physical surveillance is

also allowed. Similarly, Braga, Papa Christos, & Hureau et. al. argue that data of crime hot spots and types of crimes if used to predict the crime and to devise the patrol patterns, then it is not invasion of privacy rights because this data remains impersonal and useful for all people (Braga *et al.*, 2014).

Some others have expressed the normative argument for violation of privacy rights. Usual example is security check of personal belongings of the passengers at the airports. All passengers have to put their personal items through scanners and in some cases have to undergo body scanning in order to protect the right of safety and security of other passengers. This is weighed more than their own right of keeping personal belongings locked and unchecked by anyone else or not exposing oneself to the scanners as some of the scanners are very incisive and exposure demanding in fact. The same applies to market encounters where cameras are installed in the stores and all entrants have to show all the articles they are bringing in or taking out. It means that privacy rights can be violated if some other rights are protected in larger interest of the others.

In the past privacy in public spaces was not empirically found satisfactory because people, despite knowledge of being under various surveillance systems, were less concerned if they were observed at different times of the day and night by various surveillance systems for it wasn't affecting their normal routine. They knew that if someone is found moving from point A to point B or someone is being watched reading a paper or involved in any such activity which is not harming or affecting anyone, then it is acceptable. In addition, if such information was not used negatively by the surveillance authority and the persons under surveillance do nothing wrong then it will not change anything for both the parties. Empirical evidence, hence, didn't support the thesis of privacy in such situation and there was no justification to avoid this surveillance under the pretext of privacy rights. (Braga *et al.*, 2014) argue that data of crime hot spots and types of crimes if used to predict

the crime and to devise the patrol patterns, then it is not invasion of privacy rights this data remains impersonal and useful for all people.

The above-mentioned arguments can be challenged in recent times because of developments in the field of information technology and communication (ICT). For example, empirical argument can be challenged because now surveillance system capability has improved considerably and same data can be preserved and analyzed through high powered and fast analytical tools to predict behavior and develop patterns in more than one way (SAS, 2020). The information about one's actions and even gestures not only can be captured directly and indirectly but can also be recorded for longer periods of time and can be shared with a lot more people and on multiple forums within no time (Frankenfield, 2019). Video enabled cell phones and social media platforms are two most common methods to capture data and publish it. Latest addition to these devices is use of Unmanned Aerial Vehicles (UAVs) which makes it challenging for regulators to control and trace out the violators (McNeal, 2014). On pubic platforms like www.youtube.com, WhatsApp and many other applications information uploaded by anyone can become viral in a very short span of time (Abdul; *et al.*, 2012). By acquiring this data some of the commercial users of the data can change or alter preferences of their clients by modifying the content they are watching on their cyber space time and again. Similarly, sometime individual rights were required to be preserved as compared to collective rights, or nonetheless making this trade-off is becoming difficult, to say the least.

Nonetheless commercial world and technology companies are mindful of these rights and many steps are introduced in most of the advanced applications where data sharing is done with the explicit consent of the users. In some cases, it is made mandatory but in other cases, for example, for sharing one's location, warnings are issued to the users that they are about to share their location which may be used by the content providers for multiple purposes. This is probably the way forward for losing the anonymity

by consent. However, still exist the cases where leading firms like Facebook were under discussion for selling data or unable to secure data of the users (Zuckerberg, 2018).

2.4. Public Significance Lens

In light of the above, Nissenbaum says, *''the mechanisms to deal with conflicts involving privacy in public and have generally not taken up hard questions about surveillance in non-intimate realms to determine when such surveillance is morally acceptable and when not''* (Nissenbaum, 1998, 2011; Zimmer, 2005). Reidenberg, while analysing Nissenbaum' view, considers that recent case laws have developed to apply filters of public significance on issues of privacy in public (Reidenberg, 2014). Courts, at least in USA, have taken a view that if there is information of public significance e.g. name of victim of a crime, it may be published if name is acquired through lawful process (Reidenberg, 2014).

Contrary to the above there are a number of researchers who critique the emergence rather existence of privacy rights as a separate concept during the 19th and 20th century. They contend that these "privacy rights" are no more than the usual moral and legal rights already available (Schoeman, 1984). Some other human rights activists, opine in particular feminist right advocates that privacy rights must be protected in public spaces and there should be adequate state response for their protection (O'Brien, 2008).

In another view, privacy is construed as a public good. People are collectively interested in maintaining a society in which their freedom and rights are protected including the right to privacy (Commons, 2008). In such a society there is also a fair expectation that there will be no interference in the lives of the people. It is believed that people are more willing to contribute in such a society where their rights are protected (Slobogin, 2002).

This shows that public significance is another criterion to be applied for deciding about privacy rights. This approach, if applied at a wider scale, can lead to justification of search for such information sources. Similarly, mechanisms of public significance, like surveillance, can also be put in place for greater good of the people even at the cost of individual privacy rights.

2.5. Privacy in Cultural Context

In Pakistani context, concept of privacy is deeply rooted in the cultural fabric only to be reinforced by religious teaching of Islam. Islamic injunctions prevent untoward intrusion of any person into life and person of any other person. Same case is applied in social and cultural realm where government authorities are also not allowed to interfere even during discharging public obligations like search by the Police authorities.

There are also some cultural issues in Pakistan which are directly linked with privacy and surveillance. Just like any other modern civilized nation, it is not acceptable to stare at a woman as it is considered unethical and may have a reaction from the woman or her male relatives. Same is true to keep her under physical surveillance in public without some very strong reasons. Veil is a local tradition in India and Pakistan well before the arrival of Islam (Foundation, 2018; Hayat, 2007) . Women use veil to cover their face and their body parts like arms or head are also not exposed in public and at times even in front of their relatives as it is seen as a sign of modesty of a woman to remain covered and maintain privacy. Even if women don't use a veil, privacy of women is more strictly respected even in public. Modern tools like Facial Recognition software become less useful in case of women who may use a veil. There is further likelihood of this limitation of Surveillance in rural areas as compared to urban areas. Similarly, if there is a strong reason or suspicion then it is more acceptable to follow a lead in urban areas about a woman.

Trespassing into homes is not only a violation of property rights but also an intrusion of privacy which is a matter of honor worth taking life of any trespasser on grounds of violation of privacy even in the twenty first century. There are numerous incidents to cite that extreme actions were taken if anyone tried to desecrate the modesty of any woman in public or in private even symbolically (Hirschman, 1981; Khan, 2005; Nisar, 2020). Discussion goes as far as that women are treated as a property and any such act by aggressor is construed as trespass (Kathlyn, 2012; Zielinski, 2015). In this backdrop, if any data, pictures, video or other details are leaked or shared in an unacceptable manner, related to any person, then it creates enormous problems.

Privacy rights are respected in Pakistan due to religious significance of this concept also. Like India, Arab culture have similar traditions which were also part of religious texts like Quran. Islam also attached significance to privacy at home and there are specific verses in which it is categorically mentioned not to intrude into lives of others. Few of these verses are quoted below:

'Do not spy on one another' (Holy Quran, Surah Al-Hujurat (49:12))

'Do not enter any houses except your own homes unless you are sure of their occupants' consent' (Holy Quran, Surah An-Nur (24:28))

'O believers! Enter not the houses other than your own, until you take permission and salute the residents thereof. This is better for you, haply you may be heedful.'(*Holy Quran, Surah An-Nur (24:27)*)

The Prophet Muhammad (Peace be upon Him) also issued directions to his followers that they should not even enter their own homes surreptitiously or without giving warning of their arrivals (Khan, 1980).

In this cultural and religious context, laws are developed and right of privacy is accepted at the highest level in the constitution of Pakistan of 1973. As per

Article 14 (1) of fundamental human rights in the Constitution of Pakistan 1973 privacy in home is treated as a right (Chitkara, 1997). This Article deals with inviolability of dignity of man etc. All this proves that privacy is an established and age-old concept in Pakistan for social, religious hence political reasons, however, it is not identical to western thoughts or practices as it is seen today in international the scenario.

It shows that concept of privacy is very much understood and practices in Pakistani culture. Despite these limitations and respect for privacy of individuals, modern technology is paving way for increased surveillance of individuals for more than one reason. First reason is availability of economical means of electronic surveillance as compared to human surveillance. Other reason is data generation and possibility of its dissemination at mass scale which causes issues for people whose personal information is part of this data. In this backdrop, the law makers face challenges in formulating new legal injunctions about privacy rights in those societies where mass surveillance systems are beginning to be deployed and are underway. Pakistan is a curious case study in this context.

As Pakistan is heading towards technical solutions of surveillance, therefore, there is need to take many steps like building databases of suspicious persons, properties, vehicles and even spatial features in Geographical Information System (GIS). This lack of systemic information results in anonymity at least in the urban milieu. In the absence of well-structured databases, privacy of persons is involuntarily protected than the situation where surveillance teams have all the other allied information available. However, this does not go in favor of the law enforcement agencies who cannot utilize the system when challenges of building databases are much higher because it involves other departments like Excise & Taxation and Narcotics Control Department for data of registered vehicles, properties, tenants and their owners.

2.6. Protection of Privacy Rights in Pakistan

Privacy, as seen in the western world, is evolution of case laws and a consequence of interference of state authorities in everyday affairs of individuals. Proponents of civil liberties have taken up this issue and in modern society, it is seen as a lawful claim. Earliest references to this right are found in Universal Declaration of Human Rights (UDHR) in 1946. It states that *"No one shall be subjected to arbitrary interference with his privacy, family, home or correspondence, nor to attacks upon his honor and reputation. Everyone has the right to the protection of the law against such interference or attacks*" (UNDHR, 1946)**.** It is also reflected in the Constitution of Pakistan, 1973.

Since 1973, Article 14 (1) of the Constitution of the Islamic Republic of Pakistan confirms that *"[t]he dignity of man and, subject to law, the privacy of home, shall be inviolable" (Constitution Pakistan, 1973).* It is part of Chapter II, the fundamental human rights of the citizens and read with Article 8 of the Constitution, it precedes over any other law which is inconsistent with this provision of the Constitution.

Article 8 of the Constitution states that *"[any law, or any custom or usage having the force of law, in so far as it is inconsistent with the rights conferred [under the Constitution], shall, to the extent of such inconsistency, be void (Constitution Pakistan, 1973)*."

Article 8 (5), furthermore, provides that *"[t]he rights conferred by this Chapter shall not be suspended except as expressly provided by the Constitution (Constitution Pakistan, 1973)*." However, Pakistan's constitution also includes certain exceptions to the primacy of fundamental rights e.g. in case of emergency for one to mention.

From a cultural point of view, Police rules were framed in subcontinent in 1934 which protected the privacy of the persons by allowing the body search

of a woman by a female and a man's search by a male officer, still applicable at all airports of the world. House searches, entering into premises for lawful purposes requires that female Police Officers are part of the search team in case they need to search a woman suspect. In Chapter 25 of Police Rules 1934, Rule 25-23 describes the procedures for search process by a police officer as given below:

(1) *The rules regarding searches by police officers are contained in section 165 and 166, Code of Criminal Procedure 1898.*
(2) *Notices of search under section 165, Criminal Procedure Code, 1898*
(3) *Summons to persons to witness search under section 103 (1), Criminal Procedure Code, 1898, and*
(4) *Search lists under section 103(2), Criminal Procedure Code, 1898 shall be prepared in forms 25.23(1) (a) (b) and (c), respectively*. (Rules, 1934)

These laws are derived from local customs, religious injunctions and cultural values. In Pakistan, just as described in Fourth Constitutional Amendment in USA, and in line with Article 14 (1) of Constitution of Pakistan and Criminal Procedure Code of 1898, in ordinary cases search of private places without public witnesses and prior authorization and warrant by a court of law is not allowed. Section 165 and section 166 read with Punjab Police Rules 1934 illustrate the procedures for the protection of privacy of home and of the persons to be respected by Police officers (CrPC, 1898).

2.7. International Obligations

In addition to the Constitutional obligations and criminal justice system, Pakistan has also made international commitments to Privacy rights.

Pakistan signed **the International Covenant on Civil and Political Rights** on April 2008 and ratified on June 2010. Article 17 of the ICCPR states that

"no one shall be subject to arbitrary or unlawful interference with his privacy, family correspondence (ICCPR, 1976)".

Pakistan has also signed **the Cairo Declaration on Human Rights In Islam** in August 1990. Article 18 of the CDHRI provides that:

(a) Everyone shall have the right to live in security for himself, his religion, his dependents, his honor and his property.

(b) Everyone shall have the right to privacy in the conduct of his private affairs, in his home, among his family, with regard to his property and his relationships. It is not permitted to spy on him, to place him under surveillance or to besmirch his good name. The State shall protect him from arbitrary interference.

(c) A private residence is inviolable in all cases. It will not be entered without permission from its inhabitants or in any unlawful manner, nor shall it be demolished or confiscated and its dwellers evicted. (CDHRI, 2012)"

In addition, Pakistan also ratified **the Convention on the Rights of the Child** (CRC) in November 1990. According to Article 16 of the CRC;

"1) No child shall be subjected to arbitrary or unlawful interference with his or her privacy, family, home or correspondence, nor to unlawful attacks on his or her honour and reputation.

2) The child has the right to the protection of the law against such interference or attacks " (CRC, 1989)

In addition to these national and international obligations, Pakistani case is also interesting from cultural and religious points of view.

2.8. Changing Scenarios

Although in many societies protective measures for privacy are strictly applied, as is the case of Germany, but in other countries *Privacy in public* is not guaranteed when it comes to conflicting rights of security (Raul, 2018,

2018). Recent developments on this subject have evolved in various countries of Europe in the wake of technological developments. Cyber world is more sensitive about it since use of social platforms where people voluntarily share their information and data. Although there are restrictions available to all users but still public profiles and information is shared by the companies and this subject crops up in public policy and security related debates (Zuckerberg, 2018).

The situation has become more critical by use of social media and growing surveillance of cyber spaces by the known and unknown actors. In conventional CCTV surveillance, it was the movement of persons and activities which were watched and people were concerned about privacy of intimate relations and their free movements. In today's world, cyber spaces are becoming actual grounds of intellectual activities and not only free speech but also sharing of personal information like what are they eating and with whom and how they are spending time. With increasing use of social platforms like twitter, Instagram and Facebook, to name a few, there is an equally rising trend of monitoring the social media and identifying the positive and negative trends from commercial preferences to political choices. This shows that conventional means of surveillance are changing rapidly. If someone had any doubt, recently Panama Leaks (Kenton, 2019) and earlier whistle blowing by Julian Assange and Edward Snowden (Snowden, 2019) have exposed that governments are sneaking into personal lives of not only ordinary people but also heads of states like Angela Merkel (Whittaker, 2019) and business tycoons like Jeff Bezos (Louis Matsakis, 2020) of Amazon are also potentially affecting the democratic choices (Cluskey, 2017).

However, for this research, focus is on video surveillance by the Public authorities through CCTV/IPNV cameras. Risks are involved as video and pictures recorded through these cameras can be disseminated on electronic and social media. Therefore, collection of this data, preservation and safe handling of such data by the operators of the system is of critical importance

from the public point of view. PSCA, claims that comprehensive training programs are designed and implemented for Police Communications Officers (PCO) who are appointed for surveillance of public places.

2.9. Surveillance

Surveillance, in any form whether electronic or human, is the most common and a large-scale activity by governmental or non-governmental actors which has the potential to affect the privacy rights of the individuals. The term surveillance is used in a variety of ways related to technologies, persons, places and purposes and subjects of surveillance (Neyland, 2006). Rule says that 'Surveillance entails a means of knowing when rules are being obeyed, when they are broken, and most importantly, who is responsible for which' (Rule, 1973). Lyon defines surveillance as: 'any collection and processing of personal data, whether identifiable or not, for the purposes of influencing or managing those whose data have been garnered' (Lyon, 2001). Bennett suggests that greater attention needs to be paid to the details of exactly who has their personal data scrutinized, and for what purpose (Bennett, 2005; Zureik & Salter, 2013). Bennett opines that most of the data collected on everyday basis is neither of any interest for the user nor for the subject of surveillance (Bennett, 2005). George Orwell in his famous novel *1984* mentioned that over the period of time people will get used to this surveillance (Orwell, 1984).

On the other hand, McCahill argues that *'the introduction of new surveillance technologies always has a social impact, and this impact can be both positive and negative'* (McCahill, 2007). From public perspective, Bennett questioned that people should have a right to know that who is under surveillance and for what purpose (Bennett, 2005). He suggested that it should not be very common practice but very selective with clear purpose and a specific end. Marx argues that attention should be paid to the '*places, spaces, networks*

and categories' of surveillance, beyond any focus on the individual' (Marx, 2002). However, these are not the only views on surveillance.

Modern day surveillance through ubiquitous cameras systems from a distant centralized location is like a super Panopticon. Panopticon was a prison designed for surveillance of prisoners presented by Jeremy Bentham and later expounded by philosopher and historian Foucault (Elmer, 2012; Jespersen *et al.*, 2007). It was a very interesting concept in criminal justice system (Foucault, 1977). Main theme of Panopticon was asymmetry of viewing between the viewers and the viewed. The persons under surveillance always deemed that someone was watching them but they could not see him/her behind venetian blinds. Foucault said "[*he who is subjected to a field of visibility, and who knows it, assumes responsibility for the constraints of power; … he becomes the principle of his own subjection"* (Foucault, 1977). Foucault expounded that fundamental concept of this asymmetrical information between the subjects and masters were to discipline the inmates of the prison. To him, modern society is a "disciplinary society" and to ensure the submission of the people to any social norms, rules and laws, it is vital that the state or corporations has more information about the public and their perception, choices, behavior and action (Burchell *et al.*, 2008; Foucault, 1977). Therefore, information or data is an essential attribute of power and in today's "information society" state and associated private enterprises are married to fast growing information technologies and mutually reinforce each other (Martin, 2008; Simitis, 1987). Norris and Armstrong, in their analysis of the United Kingdom as one of the most *surveillance societies*, point out that this is possible through modern ICT and technical advancement of information management systems (Norris & Armstrong, 1999).

In this vein, most valuable surveillance devices are computers and data centers which keep public or private owned databases to keep, to analyze and to market the data gathered through other data collection devices or

sensors. In today's world, integration of this data is helpful for painting pictures of people which were not possible through any other means earlier. In addition, now a days, not only state-owned information is available but the private preferences of the people are also available which are revealed through the use of credit cards, online shopping, dating website, customers cards of commercial outlets and telephones calls data to mention a few.

Surveillance can be used either through state operated equipment or through voluntary participation of the data providers for addressing the everyday issues of the public e.g. parking, traffic management or even for emergency response. Conversely, it can be used for highly controversial political ends linked to manage the public behavior and opinion. Therefore, it can be a double-edged tool. Taylor argues that stated positive intentions of the surveillance authorities cannot be taken for granted and the people who are subjects of surveillance have the right to know about the operators, operations and purposes of the surveillance (Taylor, 2002). After all, it is people's personal information which is being monitored and they may forego their privacy rights to the state for greater public good but they also want to keep a check on this activity to limit its unintended and unconstrained uses which may have serious consequences for them in short and long term. For example, untrained operators may resort to voyeurism or trained intelligence operators may be overstepping their authority for political purposes.

2.10. Surveillance and Law

Law in many societies accepts the concept of declaring some places and concepts off-limits. The political writer Carl Friedrichs stated that legal cover is aimed at "*primarily that of protecting the private sphere against intruders, whether government or not*"(Friedrich, 2017). In the US, the Fourth constitutional Amendment limits physical searches and intrusions by state authorities and concept of Privacy is derived by the courts on the basis of principles enshrined in this amendment.

The Fourth Constitutional Amendment of American Constitution in Bill of Rights says, *"The right of the people to be secure in their persons, houses, papers, and effects, [a] against unreasonable searches and seizures, shall not be violated, and no Warrants shall issue, but upon probable cause, supported by Oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized".* Lately some laws, like Patriot Act 2010, have been introduced for security purposes but these were agitated by the privacy rights defenders' groups (Duignan, 2001).

UK is often considered one of the countries with large number of surveillance cameras and called Champion of CCTV surveillance (Slobogin, 2002; Welsh *et al.*, 2003). UK's CCTV cameras are covered under Article 8 of the European Convention for the Protection of Human Rights and Fundamental Freedoms 1950 (ECHR, 1950). UK's Regulation of Investigatory Powers Act (RIPA, 2000) also give governmental authorities powers of surveillance and intercept communications (RIPA, 2000). Article 8 of ECHR, still applicable to the United Kingdom after Brexit till writing of this research, states that:

1. *"Everyone has the right to respect for his private and family life, his home and his correspondence;*
2. *There shall be no interference by a public authority with the exercise of this right except as in accordance with the law and is necessary in a democratic society in the interests of national security, public safety or the economic well-being of the country, for the prevention of disorder or crime, for the protection of health of morals, or for the protection of the rights and freedoms of others."*(ECHR, 1950)

European Court of Human Rights (ECtHR) has discussed the issue of Article 8 in some cases. The technology has progressed fast in recent years and intelligent monitoring and recognitions systems are being employed at a

number of places including United Kingdom (Richards, 2013) and USA (Richards & King, 2014). ECtHR applied principles of objectivity and reasonability in deciding case about application of Article 8. In *P.G. and J.H. v. United Kingdom* court stated that:

"There are a number of elements relevant to a consideration of whether a person's private life is concerned by measures affected outside a person's home or private premises. Since there are occasions when people knowingly or intentionally involve themselves in activities which are or may be recorded or reported in a public manner, a person's reasonable expectations as to privacy may be a significant, although not necessarily conclusive, factor. A person who walks down the street will, inevitably, be visible to any member of the public who is also present. Monitoring by technological means of the same public scene (for example, a security guard viewing through closed-circuit television) is of a similar character. Private-life considerations may arise, however, once any systematic or permanent record comes into existence of such material from the public domain. It is for this reason that files gathered by security services on a particular individual fall within the scope of Article 8, even where the information has not been gathered by any intrusive or covert method" (par.57) (Nash, 2002).

Neil Richards while exposing dangers of surveillance proposes few principles for law making on surveillance issues (Richards, 2013). His two points are relevant here: First, he suggests that surveillance is not only from law enforcement agencies but also from the commercial world and none of them have clearly demarcated private or public lines to respect the privacy rights. Secondly, he opines that unauthorized and secret surveillance of physical or intellectual activities must not be allowed in any piece of law (Richards, 2013).

Technological, political and geopolitical developments since 9/11 have given considerable reasons to the opponents of privacy rights who want to prefer

security over individuals' rights of privacy. In some countries, like UK and Turkey, there are proper mechanisms to enforce surveillance by security agents but in some countries, people are more conscious about their privacy rights and surveillance is discouraged e.g. in Germany (Clarke, 2014; Tekin, 2014; Wood & Webster, 2009). Germany has been the most conscious nation about data protection and has led the efforts of protection of data in Europe. First Data Protection Act of State of Hesse was enacted in Germany in 1970 (Law.gov, 2018) This became a trend in the Federal Republic of Germany. On January 1,1978, the first Federal Data Protection Act (BDSG) was enacted (Clarke, 2014).

China, recently, is known for employing advanced surveillance technologies for various purposes. Especially in AI application combined with Big Data they have surpassed any other level of surveillance and have started social audit of persons (Liang *et al.*, 2018; Qiang, 2019). In current Corona virus scanning, government of China has asked their IT companies to assist the government in finding suspects of carriers of virus and people with body temperature. This outbreak of Corona virus has exposed limits and AI based surveillance capability of the Peoples Republic of China. Companies like www.Megvii.com, a Chinese company known for facial recognition software, www.Dahua.co and www.Sensetime.com , another Chinese software company for making facial recognition software and products have developed programs to combine *Facial Recognition* and *Thermal Detection* and find people sitting in trains with feverish temperature and people sitting around them (Reuters, 2020). Despite these developments, the concept of mass surveillance has evolved and there are some international best practices already available which are considered binding for all public authorities.

2.11. Guideline for a Mass Surveillance System

International best practices show that few limitations are imposed on the surveillance in the advanced countries. This is the result of learning lessons from experiences of other nations who have taken lead in the video surveillance as a mean to enhance security in their countries.

Firstly, surveillance is allowed in a specified manner and for lawful purposes only.

Secondly, only authorized agencies should be mandated to perform this function for lawful purposes (Surette, 2005).

Thirdly, there may be limits to keep this record for certain period of time however, enforcement and monitoring of this aspect remains an elusive concept.

Fourthly, data collected through cameras cannot be used publicly for commercial or other than public safety purposed, unless specifically authorized by the custodians of the data (PSCA, 2019).

Fifthly, there are no uniform and universally acceptable conditions or requirements for surveillance for public safety and security purpose (Zehnder, 2010).

Sixthly, no technical standardization is possible due to rapid developments in Artificial Intelligence (AI), Machine Learning (ML), image processing as well as due to variation in costs and designs of surveillance systems (Feldstein, 2019).

Seventh and lastly, adoption of technology, among the criminal justice system actors, is not uniform, therefore, Police, prosecution, defense lawyers and courts may be on different pages from one another.

It is important to keep these limitations in mind while discussing surveillance systems and their potential use and abuse by the users and subjects of surveillance anywhere.

2.12. Surveillance in Pakistan

In Pakistan, first Islamabad Safe City Project was deployed in the capital of the country, Islamabad, in May 2015. On October 11, 2016, Lahore Safe City Project was operationalized in the second most populous city of the country with 11.1 million population (Statistics, 2017). The government of the Punjab has launched seven more such safe cities projects in major city centers of the province which cover a population of 30 million people thus almost 40% population of the Punjab will be under surveillance through cameras after completion of these projects within a couple of years, expectedly. Surveillance through Cameras is one of the key components of these Safe Cities Centers to be managed by Punjab Safe Cities Authority, a statutory body established on July 26, 2015 by an ordinance and then by an act of the Provincial Assembly

2.13. Legal Framework for Surveillance in Pakistan

Following are well known laws related to video surveillance in Pakistan.

2.14. Monitoring and Reconciliation of Telephony Traffic Regulations (2010)

Section 4 of the Monitoring and Reconciliation of Telephony Traffic Regulations (2010) obliges each local and international service provider to ensure the monitoring of all data. It is still to verify if video application data of all calls is being monitored and stored by all international service providers.

2.15. The Investigation for Fair Trial Act (2013)

Subjected to permission from a court, this law empowers the designated law enforcement agencies of Pakistan to have access to data, emails, telephone calls, and any form of computer or mobile phone-based communication, subject to a judicial warrant. The agency can lawfully put surveillance apparatus in motion wherever its official has ‘reasons to believe’ that a citizen is, or is ‘likely to be associated’ with, or even ‘in the process of planning’ an offence under Pakistani law.

2.16. The Prevention of Electronic Crimes Act (2016)

As part of the National Action Plan (NAP) against terrorism which was developed after the deadly December terrorist attack on the Army Public School in Peshawar in 2014 in which 132 children were killed by terrorists, the Prevention of Electronic Crimes Act (PECA) was enacted on August 11, 2016.

Under Section 34 of the PECA 2016, the Pakistan Telecommunications Authority is empowered to block or remove access to information *"if it considers it necessary in the interest of the glory of Islam or the integrity, security or defense of Pakistan or any part thereof, friendly relations with foreign states, public order, decency or morality."(PECA, 2016)*

Section 36 permits *"Real-time collection and recording"* of data*: "[if a Court is satisfied on the basis of information furnished by an authorized officer that there are reasonable grounds to believe that the content of any information is reasonably required for the purposes of a specific criminal investigation, the Court may order, with respect to information held by or passing through a service provider, to a designated agency as notified under the Investigation for Fair Trial Act, 2013 (I of 2013) or any other law for the time being in force having capability to collect real time information, to collect*

or record such information in real-time coordination with the investigation agency for provision in the prescribed manner."(PECA, 2016)

Section 38 provides: *"Notwithstanding immunity granted under any other law for the time being in force, any person including a service provider while providing services under the terms of lawful contract or otherwise in accordance with the law or an authorized officer who has secured access to any material or data containing personal information about another person, discloses such material information to any other person, except when required by law, without the consent of the person concerned or in breach of lawful contract with the intent to cause or knowing that he is likely to cause harm, wrongful loss or gain to any person or compromise confidentiality of such material or data shall be punished with imprisonment for a term which may extend to three years or with fine which may extend to one million rupees or with both.*

Provided that the burden of proof of any defense taken by an accused service provider or an authorized officer that he was acting in good faith, shall be on such a service provider or the authorized officer as the case may be." (PECA, 2016)

Section 39(1) allows for the sharing of *"electronic communication or data or for the collection of evidence in electronic form" with any foreign government "24 x 7 network, any foreign agency or any international organisation or agency for the purposes of investigations or proceedings". (PECA, 2016)*

Section 39 (2) permits the government to *"forward to a foreign government….any information obtained from its own investigations if it considers that the disclosure of such information might assist the other government, agency or organisation etc." (PECA, 2016)*

The PECA 2016 provides for a judicial warrant to access data by a designated agency.

Section 29 provides: *"A service provider shall, within its existing or required technical capability, retain its specified traffic data for a minimum period of one year or such period as the Authority may notify from time to time and, subject to production of a warrant issued by the court, provide that data to the investigation agency or the authorized officer whenever so required." (PECA, 2016)*

From an oversight perspective, integrity and preservation of retained data is an important aspect of electronic surveillance which has implications for privacy rights of the citizens.

2.17. The Electronic Transaction Ordinance (ETO) 2002)

Section 5 and Section 6 of the ETO 2002 imposes data retention requirements:

"The requirement under any law that certain document, record, information, communication or transaction be retained shall be deemed satisfied by retaining it in electronic form if:

(a) the contents of the document, record, information, communication or transaction remain accessible so as to be usable for subsequent reference;

(b) the contents and form of the document, record, information, communication or transaction are as originally generated, sent or received, or can be demonstrated to represent accurately the contents and form in which it was originally generated, sent or received; and

(c) such document, record, information, communication or transaction, if any, as enables the identification of the origin and destination

of document, record, information, communication or transaction and the date and time when it was generated, sent or received, is retained".(ETO, 2002)

In Pakistan, telecommunication service providers are operating under a license awarded by PTA. Since 2004, retention of data and access to PTA was a standard requirement for running operations in Pakistan.

The PECA 2016 has been criticized by the human rights organizations as it subsumes larger areas including national security, blasphemy, online harassment and cybercrimes and gives wide ranging powers to law enforcement agencies for surveillance and access to private data impinging upon privacy rights (International, 2019). However, it also makes international cooperation possible which was the missing element in the Pakistani laws.

2.18. Video Surveillance of Public Spaces

About legality of video surveillance or protection of privacy rights there are no challenges faced by the PSCA so far. There is no mention of inviolability of privacy at public places. Article 9 of the chapter 2 of the Constitution of Pakistan provides that no person shall be deprived of life or liberty save in accordance with law (Constitution Pakistan, 1973). The video surveillance does not restrict the limit their liberty in conventional terms but it is designed to provide data about activities and movements of persons to the state agencies when they demand this data for lawful purposes. The system operators may focus on a specific person or vehicle at any point of time with the help of advanced artificial intelligent system and other software to monitor and analyse this data for security purposes.

The people who are under surveillance through cameras are not fully aware with all intended and unintended consequences of this data collection, preservation and sharing with other law enforcement agencies. It is presumed that they can look at the CCTV cameras and word like "Safe City

Spot" is printed on each pole to explain that they are under surveillance. Through TV programs and interviews they have been informed. Intended purpose may include prevention and detection of crimes and use of data for maintaining law and order situation or management of important public events at public places which are under the range of such cameras. The unintended consequences may arise if some videos through these cameras are being leaked which might compromise the integrity of the systematic protection of data collection and preservation. Multiple uses of such data, easier and long-term preservation of data creates more discomfort for the people who happen to be there at any point of time.

2.19. Privacy Vs Surveillance

Focus in this research is on Lahore Safe City Project keeping in mind the two divergent concepts of privacy and video surveillance. Proponents of Privacy rights express that Article 12 of the United Nation's Universal Declaration of Human Rights prohibits installation of video surveillance systems in public places. It states that "*No one shall be subjected to arbitrary interference with his privacy, family, home or correspondence, nor to attacks upon his honor and reputation. Everyone has the right to the protection of the law against such interference or attacks*" (UNDHR, 1946). But individual privacy rights in case of criminal activity are contradictory to the surveillance requirements and security concerns. To cite few examples, USA development of *Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism Act of 2001*, commonly known as The USA Patriot Act (USA, 2010), European Cyber Crimes Law (EU, 2011-2019) and in the Protection of Pakistan Act 2014 (POPA, 2014) clearly prefer security over civil liberties under these laws (van den Broek *et al.*, 2017).

On the other side, it can be argued that increased security environment is also a precondition for protection of privacy rights of the population at large. It is about control through information gathered through digital means. By

increase in control over public spaces, it becomes convenient to maintain social security. Bowyer postulated that for protection of privacy, it is required to understand potential of technology for security and prevention of abuse (Bowyer, 2004). Here also arises the increased need of encryption of data and anonymity which can help in increased security.

In Punjab, no district had any comprehensive electronic surveillance system in place until October 2016 (PTV, 2016). Sporadic and privately arranged cameras were installed at some places but without any robust system of monitoring and data management. There was no surveillance system because of many factors including technical inability to design and implement an innovative system, cost of investment and political will to invest in civilian capacity building at large scale. Consequently, there is no base line to compare and analyze status of privacy rights with and without Lahore safe city project and its surveillance mechanism. In the absence of any such study and data, there are challenges in strategic planning, management, law making process and implementation of such laws. For some people, there is a fundamental question to ask about cost and benefit analysis of contemporary surveillance methods in light of the fast-growing demand for safety and security in the urban areas of Pakistan for promoting business and recreational activities which is not within the scope of this research.

2.20. Legality of Evidence Management

In due course of time, courts will be dealing with such evidence more frequently and shall encourage investigators and prosecutors to rely more and more on forensics evidence. As per PSCA, from 2017 to 2019 in 16125 cases, electronic evidence is provided to investigators to be used in the courts of law in Lahore. Soon, preservation and presentation of such evidence shall come under question increasingly. PSCA is taking necessary pre-cautions for protection of data but there is also need to ensure that standard operating procedures are regularly updated and implemented in

letter and spirit to pass strict scrutiny of law. In this respect significant steps were taken by PSCA.

PSCA started engaging legal fraternity on board envisaging these issues much earlier during execution of this project. At least three stakeholder consultative sessions were held in 2016, 2017 and 2020 to share the legal concerns with the prosecutors, Attorney General's office, judges and legal fraternity (PSCA.TV, 2019). Consultations held and a draft was prepared about the process of collection, preservation, sharing and dissemination of the electronic evidence by a committee of experts from each organisation criminal justice system. The committee was formed to come to a common ground unanimously discussing all the relevant laws and implications of the electronic evidence available through cameras of Lahore Safe City Project. Details were also discussed with Judicial officers at the district.

As a result, two significant outputs were achieved. Firstly, an amendment was proposed through the Provincial Government to amend the Qanoon I Shahadat Order of 1984 in section 164 to declare evidence collected with the help of modern devices admissible in a court of law. This amendment was approved by the Federal government and following was added in the Section 164. "*Production of evidence that has become available because of modern devices, etc.: In such cases as the Court may consider appropriate, the Court may allow to be produced any evidence that may have become available because of modern devices or techniques* (QSO, 1984).

Although the admissibility is at the discretion of the court but recent case of a young girl Zainab Fatima in Kasur is a proof of wide acceptance of any circumstantial and forensic evidence by the courts for conviction of the accused in this high-profile rape with murder case (PSCA.TV, 2019). Similarly, there are more than 200 evidences being provided by the PSCA to investigators of Lahore in cases of street crimes to cases related to Anti-Terrorism Courts (PSCA, 2019).

Second important development by PSCA is to develop a comprehensive mechanism to preserve and share electronic data. The board known as the "Authority" approved Electronic Data Analysis Regulations (EDAR) 2016 which clearly define the process, chain of custody, procedures and certification to provide electronic evidence to the authorized applicants. Since then these regulations are used without any complaints and continuous training is in progress for prosecutors, investigators and Judges by PSCA as envisaged in these regulations, first of its kind in Pakistan. Main purpose behind these regulations is protection of data and privacy of information which is ensured through this elaborate process which is just a beginning and open to test of time and interpretations by the experts of CJS. It is a first attempt in Pakistan to proactively address the public privacy as well as data protections issues and all stakeholders are appreciating this development (DPP, 2018).

2.21. Use or abuse of Authority

Human rights activist groups in the Punjab, so far, are at a bay from such technological developments and use of highly definition surveillance camera system through Safe Cities Projects. PSCA has also developed for first time in Pakistan, Data and Privacy Protection Procedures (DP3) in consultation with legal practitioners' community in 2020 (DP3, 2020). PSCA has strongly advocated for the protection of data and privacy since 2016, when it installed first IPNV cameras for mass surveillance in city of Lahore. There was a case filed in Lahore High Court to question about Privacy procedures of PSCA and how data management is being taken care of at PSCA (DAWN, 2019). PSCA has responded with details about DP3 and EDAR 2016 (DP3, 2020). PSCA has also informed the Court about steps taken by the Authority for proposed changes in the Constitution of Pakistan to expand the meaning of Privacy in the constitution and allowing for protection of fundamental right of Privacy of citizens of Pakistan at all places rather limiting it to boundaries of home only. In addition, PSCA has also requested the Law Department to include PSCA

as an expert institution under section 510 of Criminal Procedure Code (Cr.P.C) 1898 so that digital evidence provided by the PSCA becomes *per se* admissible in courts of law (DP3, 2020).

There will be a need to highlight the inherent risks involved in any mass surveillance system, which may arise due to individual performance of Police Communication officers (PCOs) and technical officers who are handling such sensitive data. There is a realistic probability that any of them turn rogue and violate the procedures of surveillance and compromise privacy of data (Surette, 2005). In Pakistani society, if we only consider the gender perspective, it is a matter of honor and shame if pictures of any female are floated without their consent. It will erode credibility of the PSCA if such acts are committed by any individual of PSCA. Similarly, another example is about road accidents and their effects on the society. So far there are no sound and robust insurance policies and the implementation is even less rigorous in Pakistan about damages to parties involved in the accidents on the roads. With increased awareness, people will benefit from this surveillance system and with appropriate accountability; it is possible that drivers start acting in a more responsible fashion. Conversely, many of the minor incidents go unrecorded in Police records and incidents are resolved among the parties by mutual negotiations informally, and time on the spot. If people are aware that video evidence can be made available when they need it in case of a road accident or eventuality, as is the case in UK where insurance companies are encouraging drivers to install cameras to monitor their performance and events, they may resort to lawful resolution, and rightly so, but it will increase the work load for Police. If Police Communication officers (PCOs) and their supervisors do not act in a responsible manner, social implications of leaking of videos of people on any platform may cause mayhem.

Similarly, some technological glitch may occur or irresponsible behavior of any technical or administrative handler as can happen like any other such

facility. However, this possibility remains valid if a weapon is handed over to any Police officer who may abuse the use of force procedures. This risk is mitigated generally, by recruiting right persons, imparting proper trainings and monitoring the conduct of officers in such organizations. These measures, however, only minimize the risks but do not eliminate the risks completely.

Other than recruitment, training and monitoring in the PPIC3 Centre, PSCA makes efforts to keep a check on background of the operators and handlers through intelligence agencies as well as by monitoring their everyday performance, however, it is a continuous and unending process. PSCA also claims that the existing set up has end to end encryption of video surveillance from technical perspective. Officers are also provided special trainings about privacy issues and PSCA is probably only organization in Punjab and even in Pakistan, which has a Privacy policy which is available online for everyone to access (Policy, 2016). It's a first such attempt in Pakistan as video surveillance data of this volume is not available under any framework. PSCA's Privacy policy is in the form of questions and answers and PSCA confirms that it does not share or sale personal identification information of individuals with any third parties nor uses it for any other purposes than security (Policy, 2016).

This discussion of surveillance and privacy is based upon the principal of protection of psychological need to feel safe in real and virtual space from undesired interference. Hence, development of a secure space for trust building and intimacy to promote a healthy society where individuals' rights are protected and it can be justified on moral and utilitarian perspective (Stahl, 2007). In the presence of 8000 cameras in public places of Lahore, it is rightful expectation of people that their privacy rights in public spaces, though not mentioned in so many words in the constitution of Pakistan, shall be protected by the responsible authorities of PSCA.

Literature shows multiple links between surveillance and privacy (Richards, 2013). *Privacy in Public* is not accepted as a valid reason to shun deployment of surveillance networks by the academics and the courts in the international arena. There is enough guidance available in international literature and best practices set by other countries to maintain the same. It is desirable to set high standards of protection of Privacy rights of public by acting with great care and caution as any leakages or breaches of system undermine the trust of the people in this modern endeavor for public safety and security (S. Khan, 2019). In addition, any violation of this trust will also stall such technological development and improvements in Police service delivery.

Chapter 3
Mass Surveillance: Demand and Designs

Recent conflicts in the world starting from 9/11 events provide sufficient evidence to mention that today's security environment is much different than the security environment of last century. Technological developments and means of communications have changed the world rapidly. Some trends like urbanization, terrorism and natural disasters have altered the security landscape not only in Pakistan but globally. Some of the factors are explained below:

3.1. Growing Urbanization

World population is fast moving from rural areas to urban areas. Year 2007 is important milestone when global population in urban areas was more than rural population in the world (Nations, 2014, 2018). Global population is growing very slowly, at the pace of 0.04% per *annum*. Global population is expected to be 9.7 billion till 2050 and will nearly around 11 billion in 2100 (Nations, 2017, 2019; Roser, 2019). According to another estimate, by 2050, the urban dwellers/residents will constitute 86% of the population in the more developed regions and 64% of that in the less developed regions (Nations, 2018) With their capacity to generate wealth and attract lucrative investments, cities have become the nexus of economic as well as political power (UNCTAD, 2017).

Cities are offering better opportunities and growth options due to availability of better physical and social infrastructures and fast-growing population are primary reasons of urbanization (Candela; Ivan Turok, 2013).This is also applicable in case of Pakistani cities. Three biggest cities of Pakistan, Karachi (20%), Lahore (12%) and Faisalabad (10%) house 40% population of Pakistan. Karachi alone contributes 21.7% to the total urban population of Pakistan, while the city of Lahore contributes 12.7% (Bahrawar Jan, 2008;

Sawe, 2019). In 1998, 32.5% of the country was urban, which is expected to grow to 50% by 2030 (Ahmed, 2013). The rapid pace of urbanization brings its own set of problems, inter alia, traffic congestion, cyber security risks, crowd management and organized crime. It has put a strain on existing infrastructure and adds to the human cost of accidents and disasters. Conventional methods of policing are not robust enough to address the challenges caused by rising urbanization in what have now become mega cities. It has become imperative to incorporate an efficient safety and security system into the urban infrastructure which can meet the new challenges through minimum emergency response times and smooth flow of required information to law enforcement agencies, decision makers and the citizens

3.1.1. Globalization

Another important factor that is challenging conventional ways of policing is the phenomena of globalization which has an impact on everything from way of doing business to implementing safety solutions. It has led to more interconnectedness between different regions of the world, integrated markets, technology sharing and given rise to a global economy where an economic downturn in one part of the world can trigger drastic changes in other areas of the world. Globalization is not only limited to the area of technology and economies but has affected security as well (Cîrdei, 2019). This growing inter-dependence and enhanced connectivity means that no country can progress efficiently in isolation from the rest of the world. Security issues now transcend boundaries which points to the fact that public safety agencies now must actively collaborate locally, nationally, and globally to address common threats (Kozlowski, 2012; Light, 2014). There is an urgent need for cross agency collaboration within the country as well to defeat the changed nature of threats. Police, military, intelligence agencies and emergency services providing authorities, public and private, must share data with each other to have a comprehensive response to security threats (Richardson, 2015).

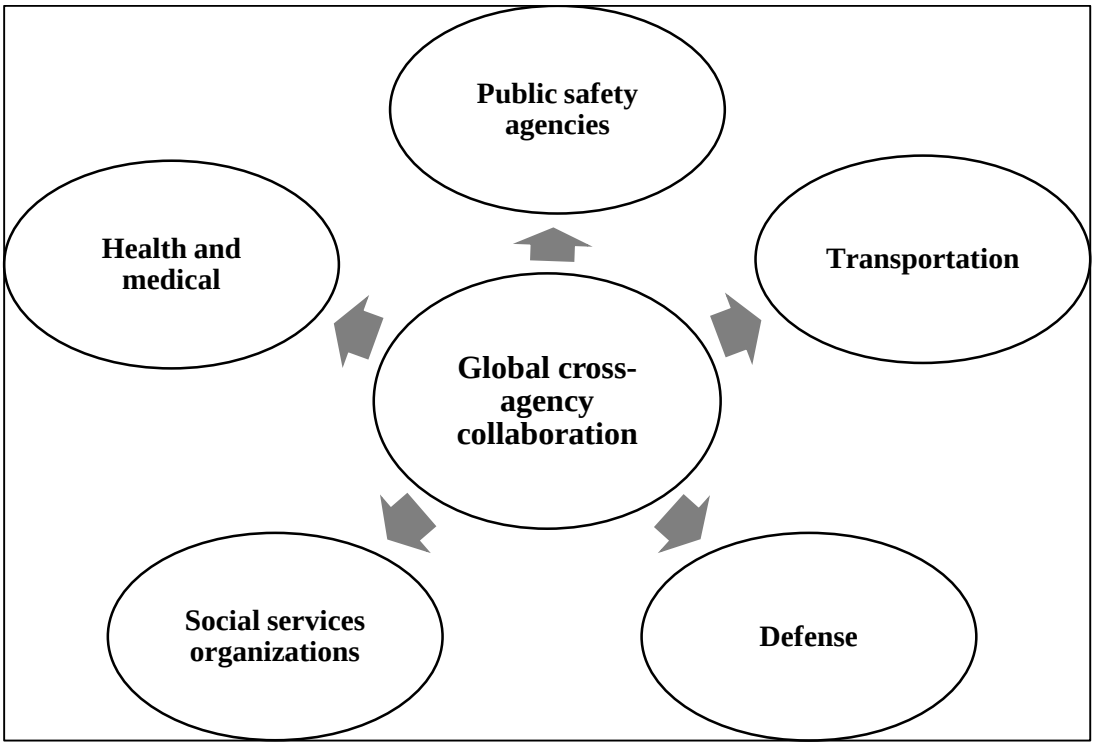


Figure 1. Global cross-agency collaboration

3.1.2. Terrorism

Pakistan is victim of Terrorism since last four decades ((IEP), 2017; Hannah Ritchie, 2019) and it is a trans national phenomenon. Similarly, religious and sectarian militancy is no more restricted to particular geographical areas. Terrorism networks now span a number of countries having international repercussions such as capital flight worth billions, brain drain, emigration, lack of foreign investments, remittances etc. Pakistan, one of the worst-hit countries by terrorism, was ranked fifth on the Global Terrorism Index according to a report published in 2019 ((IEP), 2019). The unstable situation in Afghanistan also adversely impacts the security situation in Pakistan (Cheema, 2011; Hassan, 2001). In this situation, conventional policing methods and processes have been ineffective and need drastic changes to meet such challenges.

3.1.3. Natural Disasters

Other than man-made disasters like Terrorism, Natural disasters also cause serious threats to public safety (Nelson, 2018; Tipson, 2013). According to a report, the global economic cost of natural disasters has been going up from the 1980s and is reported to be $1.7 trillion between 2001 and 2015 (Richardson, 2015). In Pakistan, natural disasters have caused losses worth $14.2 billion (approximately PKRs. 1.5 trillion) in the last five years, till 2017 it has inflicted loss of $28.29 billion (Wasif, 2017; Zaman; & Usman;, 2015). Pakistan is among the top ten countries severely hit by the Natural disasters (heat wave and extensive flooding) in 2012 and in 2013 (Kreft; *et al.*, 2016). By adapting a proactive approach, prevention and response to such disasters can be improved. An integrated system of policing and security can help to significantly mitigate the economic and other cost imposed by natural disasters through predictive analysis as well as an effective emergency response system. The modern urban environment requires a system that helps in emergency forecast, advance warning of hazardous situations, real time monitoring of environment to predict disasters and accidents so that swift actions are taken to control damage. The conventional approach to deal with public safety falls short of required response to this threat (Richardson, 2015).

3.1.4. Public Safety Issues in Pakistan

The new pressures created by a changed security environment have highlighted as well as exposed the limited capacity of existing infrastructure to deal with the new spectrum of threats, endangering public safety and security. The existing system of public safety measures is faced with, among others, the following problems:

3.1.5. Information gaps

There are information gaps between different security agencies and departments of the government in Pakistan (NACTA, 2014). Normally, government departments are blamed for making plans in silos without collaboration with other agencies on related security threats (NACTA, 2014). In the absence of an integrated system which enables sharing of important data across departments, it is difficult to develop timely responses to threats.

3.1.6. Reactive Response

The current system of security management is reactive in nature instead of being proactive (Rumi, 2015). Security tentacles are activated after an event has taken place. It lacks predictive ability and seldom gives advanced public warning about an imminent security threat (Rumi, 2015). However, a proactive approach developed through effective predictive analysis is very important for dealing with many public safety issues, from earthquakes and floods to prediction of crime etc.

3.1.7. Lack of interaction between public and police

In the existing public safety system, the interaction between the public and the law enforcement agencies is very limited and confined to specific religious events like *Moharram* or post event scenarios. These interactions are often restricted to a particular time when some emergency incident takes place. Therefore, the safety agencies remain mostly unaware of the evolving and changing important security issues faced by the public. It also hinders the flow of required information from the safety agencies to the public and vice versa. A smooth communication must occur between both the parties to develop effective responses to any potential threats.

3.2. Key Requirements of a Proposed Solution

In the conventional system of security management, separate departments and authorities were responsible for dealing with different security situations e.g. Fire protection, intrusion detection, traffic congestion, urban violence and Natural disasters like floods, earthquakes etc. Although modern technology and video surveillance was used for monitoring purposes, this infrastructure did not operate as a unified cohesive unit to deal with emergency situations (Einsig & Massott, 2005).

In this backdrop, the proposed mass surveillance system was designed to address multiple issues. It was hinging upon measurable key outputs from policing perspective to make city of Lahore safer than before. The new integrated approach to policing was required to actively engage the public and to take their feedback to improve the security operations. Following are some key outputs of any proposed solution to deal with inadequacies of a traditional system in mega cities.

3.2.1. Immediate access to relevant information

Real time monitoring and using advanced analytical ability will ensure access to relevant information to decision makers in milliseconds thereby improving the quality of response appropriate to the developing situation.

3.2.2. Surveillance of all serious incidents

The ability to actually see the incidents as they develop in totality will enable commanders to make sound judgments. Increased situational awareness automatically results in better decisions.

3.2.3. Decisive response

Efficient Resource deployment coupled with better and useful availability of information translates directly into a decisive response, tailored for each situation.

3.2.4. Monitoring mechanism

Real time locations of patrols as well as a state of the art Automatic Resource Location System will also inform commanders as and when units will become available. It will even cater for the upcoming shifts. This will result in better distribution of resources and deployment for maximum effect.

3.2.5. Accountability

Improved monitoring over deployment, optimum resource allocation, real time monitoring and electronic evidence collection will increase effetiveness, improve the quality of service, and at the same time, will make law enforcement agents and commanders much more accountable with the help of data.

In order to deal with the changing security environment that has been created by the above- mentioned factors, many countries have adopted the idea of having a holistic and integrated approach to ensuring public safety, which is also popularly known as “Safe Cities”(UNHABITAT, 1996).

3.3. Safe Cities and the United Nations

Public safety has been a fundamental duty of governments across the world. It refers to the responsibility of the state to ensure the safety of its citizens, organisations and institutions against threats to their well-being as well as the traditional functions of law and order. With more than half the global population today living in urban areas, safe city is increasingly being considered essential in ensuring secure living and prosperity. Crime, violence and fear in cities pose significant challenges. The basic principles of good governance must find a direct application in any urban safety strategy, aimed at reducing and preventing common problems of crime and insecurity.

The United Nations, through its Habitat Agenda on Human Settlements, which was adopted at the Istanbul Conference, initiated a series of approaches and strategies to effectively reduce and eradicate violence and crime within the cities (UNHABITAT, 1996). The aim of the UN-Habitat Safer Cities programme is to reinforce personal safety and reduce fear by improving safety services and accountability to the community (Nations; Walker, 2005). The Safer Cities programme has the following building blocks:

3.3.1. Building urban safety through urban vulnerabilities reduction

The UN Safer Cities programme defines vulnerability as the probability of an individual, a household or a community falling below a minimum level of welfare (e.g. poverty line) or the probability of suffering physical and socio-economic consequences (homeless or physical injury) as a result of risky events and processes (as forced eviction, crime or flood). Paying special attention to urban vulnerabilities and violence shall reduce the probability of crime and ensure a secure and safe city environment.

3.3.2. Building urban safety through urban planning, management and governance

Sustainable urbanization, by emphasizing inclusive, participatory urban planning and local development practices, incorporates policy-making and strategy development. This, in turn, promotes institutional and organizational development, resource planning and management in order to enhance efficiency in governance.

3.3.3. Improving the governance of safety

Enhancing urban safety and social cohesion are issues of good urban governance. They intend to create a city where safety is improved for its citizens and neighborhoods, where there is fearless interaction among

people and groups. These are prudent aspects of good governance which create an enabling environment for the inhabitants of the city, allowing improved quality of life and fostering economic development.

However, now a days, safe and smart cities have little different connotations.

3.4. What is a Safe or a Smart City?

Since some time, there is no specific definition of a “Safe City”. The idea of safe cities could be realized in more than one way depending upon how one defines a “Safe City”. Similarly, there is also a term in use **“Smart Cities”**. Smart and resilient cities, sustainable cities are also interchangeable terms depending upon the context and motive of the defining agency or organization. Some of the definitions of smart cities are given below:

“Smart Cities have been characterized and defined by a number of factors including sustainability, economic development and a high quality of life. These factors can be achieved through infrastructure (physical capital), human capital, social capital and/or Information and Communication Technologies (ICT) infrastructure,” (Batty *et al.*, 2012; Dinda, 2008; Hollands, 2008).

“The Smart City is a process, or series of steps, by which cities become more “livable” and resilient and, hence, are able to respond quicker to new challenges. Thus, a Smart City should enable every citizen to engage with all the services on offer, public as well as private, in a way best suited to his or her needs” (Bennett *et al.*, 2017)

“A city that monitors and integrates conditions of all of its critical infrastructures – including roads, bridges, tunnels, rails, subways, airports, seaports, communications, water, power, even major buildings – can better optimize its resources, plan its preventive maintenance

activities, and monitor security aspects while maximizing services to its citizens" (Deakin & Leydesdorff, 2013).

"Smart City is a high-tech intensive and advanced city that connects people, information and city elements using new technologies in order to create sustainable greener city, competitive and innovative commerce and an increase in quality of life with a straightforward administration and maintenance system of city" (Letaifa, 2015; Townsend, 2013).

There are many indices in the market supported by various commercial firms who define the concept in their own ways and have different indices to define Safety. "The indicators fall into four broad categories, or pillars: personal, infrastructure, health and digital security. Within each pillar, the relevant indicators are grouped into inputs of safety, such as policies or personnel dedicated to some aspect of security, and outcomes, which is anything from air pollution levels to crime rates" (Economist, 2019).

Same is the case with Smart Cities. Here both terms are used interchangeably. Fundamental concept here is to create an Integrated Command, Control & Communication Programme (IC3) which collects and shares information and data with different sources. In case of Lahore it is designed, implemented and operated by Punjab Police Department. Relevant government departments, traffic management authority, intelligence sources as well as other public and private organizations use available information to develop more effective and efficient responses to any kind of security threat. Using modern technology, video surveillance systems and communication system, it helps to deal with an array of security risks in real time. Apart from enhancing the ability to respond quickly to an emergency situation, it greatly reduces the burden on state and its resources as information is centrally stored and actions are directed through a central command authority.

3.4.1. Integrated Solution

Under the Safe City concept, these technologies are operated by a central control and command authority which is involved in the real-time monitoring of potential emergency situations and responds to them in swift manner to minimize damage and costs (PSCA., 2015) (PPIC3, 2015). The central command authority serves as a hub of data through which information is collected, disseminated and feedback is received. In other words, it is a multipurpose solution for all security issues faced by a city and is centrally controlled by an authority. It can be said, therefore, that the Safe City concept embodies an integrated solution to the problems related to public safety in urban centres. It enables disparate systems to coordinate and collaborate with one another to establish a mechanism of smart policing for modern cities.

3.4.2. Smart Policing

For this research, a safe city is one which makes the security and public safety of people as first priority. It also creates a secure enabling environment in which businesses thrive and quality of life improves as compared to other cities employing traditional and modern techniques and tools for sustainable growth and better management of resources to address challenges of urban centers. Its multiple components include a joint operations center for reduction in response times in case of emergencies, swift service delivery, real time monitoring of potential security risks at key locations, timely resolution of traffic related problems like accidents, congestion and choke points, effective crowd management and riot control.

The safe city embodies the idea of smart policing where the potential of advanced technologies is harnessed and the capability of law enforcement teams and emergency services is enhanced in order to secure urban environment. However, the existing management framework was not

sufficient to implement this idea on strategic basis so a new way of management was required.

In case of Pakistan, this concept was realized in Lahore which houses a large-scale surveillance project to transform the existing business processes of Police in the city of Lahore from age old manual and human memory-based system to a digitalized platform to improve Police services by setting up an autonomous government body, first of its kind, in the country.

3.5. Punjab Safe Cities Authority

In keeping with the Safe Cities concept and to meet the security challenges of a modern urban environment, an authority was established under the Punjab Safe Cities Ordinance 2015 for the development, construction, installation and maintenance of Integrated Command, Control and Communications Programme throughout the province.

Vision	Mission	Values
Safe, peaceful & prosperous cities of Punjab	The PSCA improves law enforcement capacity of Punjab Police to ensure timely response to emergencies & crime prevention by equipping police with state-of-the-art technology.	1. Partnership 2. Respect 3. Innovation 4. Dedication &Integrity 5. Equality

Figure 2. Organizational Contours

The Ordinance was enacted on July 07, 2015 and later turned into an Act of Provincial Assembly of Punjab province on February 06, 2016, with its governing body, executive and management setup.

Unlike any other public sector organisation, PSCA has defined five core values and stress is on practice these values in letter and spirit. PSCA has

the mandate to establish, develop and maintain integrated command, control and communication system (PPIC3) for Police in major cities of the province for public safety. It is a project of providing security and to improve quality life through economic development with the help of advanced technology, infrastructure and innovate business process.

Change in Police Culture is expected by change in business process of operations, investigations, traffic and security matters of Lahore Police as first pilot project. It was decided to appoint a full time Managing Director and Chief Operating Officer with skilled staff to effectively manage the affairs of the Authority and develop security of Lahore on the concept of Safe Cities (PSCA, 2019).

3.5.1. Board Members

According to PSCA Act of 2016, there are fourteen board members in the Authority. Chief Minister of the Punjab is the “Chairperson of Authority”. Chief Secretary Punjab is the “Chairperson of Executive Committee”. Provincial Police Officer Punjab, an officer of the rank of Inspector General of Police, is the “Chairman Management Committee”. A Deputy Inspector General or higher Rank police officer is the Managing Director of the committee and Chief Operating Officer is the Secretary of PSCA. The mandate of PSCA is to plan, develop and maintain PPIC3 Central operations are run by District Police. (**Annexure - I)**

3.5.2. Budget

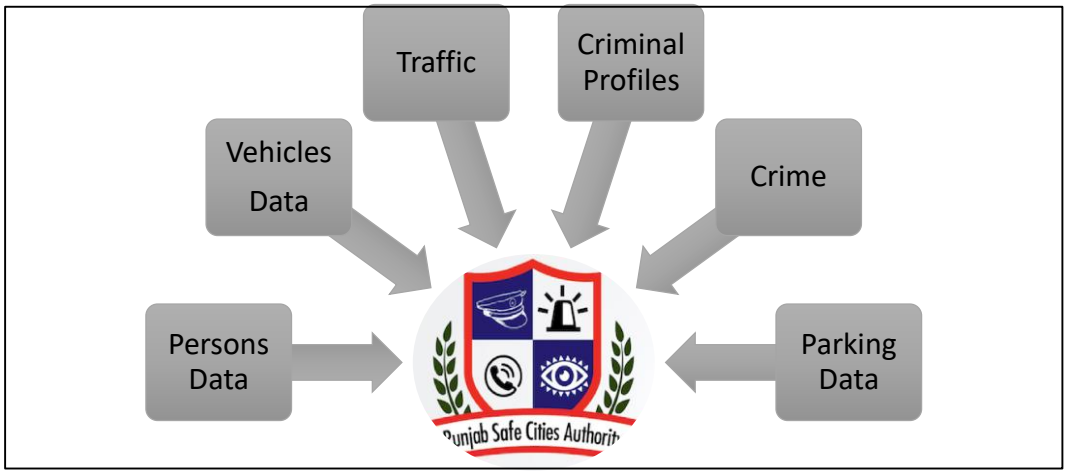
The total budget of PSCA is PKR 385 million. However, the budget of PPIC3 Lahore and Kasur is PKR 17,520 million.

3.5.3. PPIC3 Centre Lahore

The overall objective of the Punjab Police Integrated Command, Control and Communication Centre (PPIC3) Lahore program is to modernize the

infrastructure, systems and capabilities for the police to proactively manage the security situation and to professionalize the police response to incidents by moving towards directed and mission-focused deployment of resources. PPIC3 brings together an innovative Concept of Operations (ConOps) (Shahzad, 2017), quality focused business processes with an integrated technical solution to provide an operational solution that delivers new technology and infrastructure to provide real time information and intelligence to facilitate field commanders, to make evidence-based decisions.

3.5.4. Technological Components



In the Punjab, a first-of-its-kind initiative was undertaken by the Punjab Police to develop an intelligent command, control and communications infrastructure initially in the provincial capital city of Lahore, and subsequently in the larger cities to enable smart and efficient utilization of resources in order to increase the level of safety and security for its citizens as well as to increase economic investment, both local and foreign.

Figure 3. Data Sources and sharing by PSCA

Initially in 2012, the project was conceived as a mere CCTV monitoring project to be established in Lahore. However, the Safe Cities concept calls for more intelligence-led interventions, therefore the scope of the project was

increased in 2013 to develop an integrated command, control and communications setup. Thus, the Punjab Police Integrated Command, Control and Communications (PPIC3) Programme was initiated to cater for this requirement. In 2014, the Project Management Unit (PMU) for PPIC3 was established for the development, construction and maintenance of the first PPIC3 Centre to be constructed in Qurban Lines, Lahore. The project was not moving forward till July 2015 due to one reason or the other and the government of the Punjab decided to bring new leadership for the project in the form of a new Project Director on July 23, 2015.

The new Project Director took on board the services of technical and civil works consultancy firms. The unit thus undertook to develop a technology based cum cost-effective solution for an intelligence-led command infrastructure to secure the cities.

3.5.5. Concept of Operations

The objectives of the Punjab Police IC3 Programme were set to bring together an innovative Concept of Operations (ConOps) (Shahzad, 2017), quality focused business processes with integrated cutting-edge technology to provide an operational solution that delivers:

i. New technology and process infrastructure to provide *real-time information* and intelligence through surveillance and other means to facilitate field commanders making *evidence-based decisions* in operationally critical situations

ii. Ability to have *access* to and *share* information within the Punjab Police departments as well as external agencies to ensure seamless service delivery to the public and a timelier and effective response

iii. Provision of information and intelligence to ensure that *informed decisions* are made by the police with regard to priority and

allocation of the most appropriate resources in response to calls for assistance

iv. Provision of high-*quality emergency response* systems to the residents and visitors to Punjab and specifically Lahore

v. Delivery of *flexible* business and operational systems that can evolve and expand with the evolving needs of the country

vi. Increased *capacity* that acknowledges foreseeable growth for policing and security services

vii. Design and implementation of a *consolidated* IC3 organizational operating model to optimize cross agency coordination communication, and effectiveness of public safety and emergency services delivery. The envisaged scope of technologies to implement this ConOps is provided in **(Annexure - II).**

3.5.6. Guiding Principles

The PPIC3 Centre was designed and developed to achieve the objectives of the surveillance programme by following these guiding principles:

i. By adopting a **long-term proactive approach** rather than creating ad-hoc relationships in response to a developing crisis, this strategy promoted a forward thinking, long-term proactive response supported by strong personal and institutional relationships and timely shared analysis.

ii. By creating a **shared understanding,** it desired to harness the range of talents in Punjab Police and perspectives available to provide breadth, depth and resilience to continuous analysis, planning, delivery and assessment of public safety situation.

iii. By undertaking **outcome-based thinking** it resolved that activity conducted by all the stakeholders within our strategy is based and judged on the achievement of progress towards agreed objectives and a unified vision.

iv. By engaging in **collaborative working** the team worked toward achieving our objectives by fostering strong inter-personal relationships, institutional familiarity, trust, transparency and personal investment.

v. By understanding the **operating environment**, the mechanism for dealing with security situations incorporates modern approaches that were effective in responding to threats in a complex, dynamic and unpredictable environment.

vi. By involving **communities**, aim was to deliver security and safety in a way that reassures all communities and actively engage people in developing security approaches.

3.5.7. Governance of Technical Solution

The governance aspect for the Punjab Safe Cities Authority contains the following project streams:

i. Organization development by bringing in suitable skill sets
ii. Facility development to house the operations and technical components
iii. Technological Development of infrastructure within the Centre
iv. Business model of each technological module
v. Process Development for each technical and operational aspect
vi. Cultural Transformation through business change
vii. Capability and capacity development

3.6. Components of PPIC3 Centre – Safe City Project Lahore

3.6.1. Police Surveillance System

Safe Cities are laced with modern surveillance systems, video surveillance cameras, intruder detection, face recognition and automated

license plate recognition and a number of other software which provide enhanced situational awareness to Police Officers and emergency response teams. The surveillance network and equipment collect data in the form of images or videos that are monitored in real time in a strategic operations monitoring suit situated in command and control center to detect threats and develop quick responses.

Operations Monitoring Centre in the PPIC3 Centre is structured in a way which allows the use of video surveillance recordings for data visualization, real time collaboration and deep analytics. This ultimately helps Lahore Police, and other civil and military agencies in effective decision making. Collaborative monitoring is an important component of safe city project. In many cities, private organizations like hospitals, universities, transport authorities and shopping malls have deployed their own surveillance systems for ensuring security of their own property and for smooth running of the operations. For example, Metro bus Lahore and Greater Iqbal Park have installed cameras for video surveillance on their metros, stations and public places. Under collaborative monitoring, PPIC3 Centre can collect information from these multiple sources and uses them to create quick responses to any incident.

3.6.2. Network and Integration

This is the most important part of PPIC3 programme. Network connectivity enables the transfer of information and data from the surveillance equipment and field sensors to the PPIC3 center on the basis of which further decision making and resource allocation takes place. It forms the backbone of the Safe City system, as coordinated actions to handle emergency situations and threat mitigation cannot occur without uninterrupted connectivity infrastructure. It is absolutely essential for effective command and control to have a reliable, resilient and effective mode of communications between the central command and the field units. For this

purpose, the PPIC3 is equipped with a communications system based on the cutting-edge technology available.

3.6.3. Data Centers and Hubs

The data Centre of Safe City Programme is the *warehouse* where all the information and data collected from various surveillance sources is stored or processed for further action. This Centre consists of all the systems that are required by the Police to operate video management software (VM) and the video analytics application (VA), the automatic number plate recognition application (ANPR), the automatic vehicle location system and other software. The data Centre requires sufficient space and capacity in order to perform the required functions: storage, retrieval of information and analysis of collected information, images and videos etc.

3.6.4. Police Telecommunication System

As part of PPIC3 centre project, the Capital City Police Lahore has latest generation wireless solution based on public safety LTE-Advanced technology. Issues of low signal strength, sporadic coverage and lack of facilities has been resolved through an expansive network of communications which includes high speed data transfer in addition to high quality voice transmission while maintaining spectrum efficiency. The wireless sets are thus data enabled, and equipped with built-in cameras, GPS location services and also user login system which allows automated resource management systems (ARMS) to be employed for public safety and security operations. All the patrolling vehicles as part of operations and investigations, including Police Emergency Response Unit (PRU), are being provided Mobile Data Terminals (MDTs). These terminals are directly connected with the PPIC3 Center through wireless communications and have access to important databases such as Criminal Record Data, Stolen Vehicles database, biometric verification systems and also video and voice

communications. Vehicles thus equipped have improved police productivity, effectiveness and efficiency, and decrease the time to provide service to public.

3.6.5. Traffic Management System

PPIC3 Lahore is also equipped with a modern, intelligent Traffic Management System. The system is equipped with digital traffic signals of Lahore city, as well as with advanced Automated Number Plate Recognition System (ANPR), Red Light Monitoring System (RLMS), Journey Time Monitoring System (JTMS) and Variable Messaging System (VMS) in line with the most advanced smart urban traffic management technologies. The system ensures that traffic is routed in the most “free-flowing” manner possible, diverted to the shortest route in case of blockages, road works, etc. The citizens are able to monitor and plan their journeys in real time through android applications and through public Radio FM 88.6 live working round the clock. VMS display screens inform the motorists of the traffic situations at various locations and warn them in advance of any impediments further along their journeys along with what routes to take.

3.6.6. Electronic Enforcement Mechanism

Going hand in hand with smart traffic management is electronic enforcement. Violations are recorded through ANPR cameras for evidence purposes, vehicle number plates read and fine ticket commensurate with the offence is dispatched to the mailing address of the owner. This is all automated system and executed electronically. This ensures uniform and effective traffic law enforcement.

3.6.7. Special Field Assets

The PPIC3 is also equipped with unmanned aerial vehicles which monitors the traffic situation of the city and enables the operational

commanders to have real time view of the traffic loads and any hindrances that require immediate attention. This solution also includes other field assets for monitoring dynamic events and other crises situations. This helps in considerable savings of time and fuel costs of commuters and increase public satisfaction levels tremendously.

Each PPIC3 centre is an integral part of the police operational environment that allows seamless and organized access to timely information which facilitates efficient decision-making. To implement this aspect, an integrated operational model with functional distribution was designed. It was reflecte4d through an organogram which was much different than standard hierarchical organograms prevalent in the public sector **(Annexure - III).**

There were practical problems in Pakistani environment raising questions about and inclusiveness of various stakeholders in the complex bureaucratic environment (Sheikh, 2020). Testing the implementation scenario of this project of PSCA also involved political changes at provincial and national level but those are not within the scope of change management for this research. Implementation status of project policies from 2016 to 2019 has been discussed through description of technological details in next chapter. Lessons learnt through the process have also been discussed as process of change management and how it has led to other changes in legal domain in Pakistan

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Chapter 4
Mass Surveillance System

4.1. Initial Assessment of Existing System

Why was change required in Policing of Lahore? Was it a technical issue of tools, equipment, resources and finances? Was it related to political environment in which Police is operating? Was it related to leadership? It was not easy to find simple answers to these questions. However, it was singularly clear that there exist a number of weaknesses in the conventional law enforcement operational environment in Punjab and in particular the largest city Lahore of Pakistan's largest province. Sheer size of the city has created challenges for the development of a secure environment in the urban area through traditional means. Few observations about capacity of Punjab Police circa 2015 are given below:

i. Punjab Police has limited ability to perform effective collaboration before, during and immediately after crisis events using multi-mode digital data communications in major urban centers (Chaudhary, 2020).
ii. Punjab Police does not have the technical infrastructure and tools to enable effective information collection and reporting.
iii. Due to the lack of appropriate technology and processes, the current systems are inadequate to provide timely responses, secure communications and real-time situational updates, before, during and after emergency events.
iv. With the current limited interoperability, Punjab Police has a limited command and control capability for extending beyond routine events. Communication and information flow between organizations is accomplished primarily by telephone (Chaudhary, 2020).

v. As the current system is primarily based on paper, it makes it almost impossible to undertake post event analysis or planning. There may be many instances of duplication and non-value adding processes within the current system.
vi. The business processes and work practices that have evolved on an ad hoc basis cannot support the efficiency and effectiveness needed for the changing urban environment.
vii. Traffic Management System for Lahore is under tremendous pressure and manual operations are unable to meet the requirements of a mega city (Chaudhary, 2020).
viii. While there is significant physical security for Punjab Police facilities, critical information and systems are not protected by standardized physical or technology security processes.
ix. There is little in the way of standard operating policies and procedures to support either the management or operational functions. Moreover, there is a lack of technological infrastructure to support policing operations.
x. There is inadequate operational risk assessment and development of coordinated mitigation strategies to address these risks.
xi. There appear to be numerous changes and reform initiatives, but they are disjointed with little coordination or consolidation of the benefits that these initiatives may deliver for the police and for the citizen.

Punjab Police was undertaking a major shift from conventional methods of policing by adopting practical technology based solutions. There was a trend moving towards "Intelligence-based Policing" since 2013 (Strom, 2017). The Punjab Police took the lead in developing first of its kind Integrated Command, Control and Communication (PPIC3) Center at Lahore. Punjab Safe Cities Authority (PSCA) and PPIC3 Centre have been established for integration of conventional means of law enforcement with the

modern,advanced and proven techniques and practices elsewhere. The PPIC3 is expected to transform the working of Punjab Police and make the cities safer for all its inhabitants and visitors. It was not a small step for a country like Pakistan and even for the region which also has technology centres like China and India. Where identification and designing of technological solution was a challenge, the much bigger challenge was how to bring about a change as a consequence of the huge technological input. Essentially, it was a change management project, the largest in Pakistan, with so many known, unknowns and unaccounted for risks. Following few targets were set by the project team as an educated estimate:

4.1.1 Measurable Emergency Response

It was expected that through the technology provided for in the proposal, the first responders will be dispatched while the emergency call is in process, so the police response time will be reduced to within 7-9 minutes of emergency call received, which is currently 20 minutes as opposed to internationally accepted time of 12 minutes (Goodmark, 2015; Nayar, 2015). This will help in the prevention of crime, and also real time tracking and detection of suspects.

4.1.2 Intelligent Traffic Management

Another major benefit of the project will be traffic management, where public will be informed of choking and density; and alternate routes will be planned for them through Variable Messaging System, and through broadcast; thus minimizing journey times and stops at traffic signals, which will save enormous costs of fuel and time. The project also envisages traffic rules enforcement and it is estimated to generate approximately 175- 210 million in traffic violation fines every year (Choudhary, 2019; Khanna *et al.*, 2018).

4.1.3 Electronic Evidence Data Management

The PPIC3 Programme aims to increase public satisfaction levels as real time comparison of suspected persons with criminal and other allied departmental databases will make apprehension of record holders instantaneous and innocent public will not have to face the hassle of going to police station for verification of record and antecedents.

4.1.4 Proactive Response

Anticipatory technologies will ensure that police responders are dispatched to assembling congregations before they start a riot, and immediate police presence will ensure safety and security of property. Real time monitoring of processions and law and order situations will ensure efficient resource deployment for optimum effect.

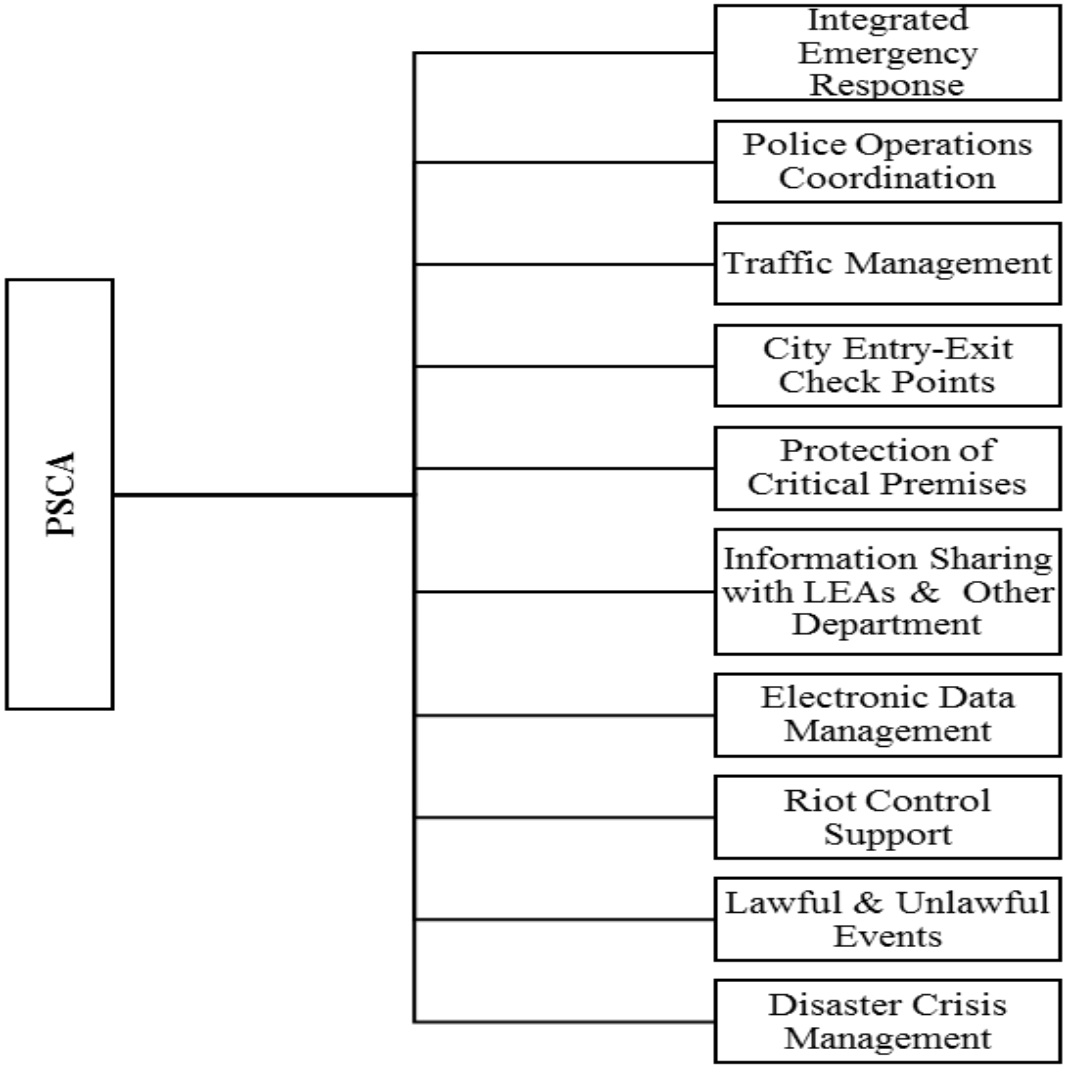
4.1.5 Information Management

The use of more sophisticated IT infrastructure helps in avoiding multiple keying of data and provides better information management and easier distribution of intelligence. It will also give the public improved access to information about Punjab Polices Services and create a common operational picture for all stakeholders. Making changes to the Punjab Police culture, structure, technology and processes will provide an enhanced service to the police and public (Brandt *et al.*, 2016; Dirks & Keeling, 2009). These targets were measured during the project execution.

4.1.6 Implementation Process

PSCA is an instrument of implementing an innovative project. The focus is mainly on the supply side of the equation and various tools were used to deliver the PPIC3 project for making Lahore Safer since 2016. Intended scope of services was mentioned in the technological solution and after three

years of the initiation of the project in 2016, Punjab Police was benefitting through PSCA from a number of services.



shows that public security is directly related to government stability, social safety and happy life harmony.

Figure 4. Urban Challenges and Role of PSCA

4.2. PPIC3 Centre - Scope of Services

The scope of services rendered through PPIC3 Lahore main centre includes:

i. Integrated Emergency Response @ 15 at Lahore

ii. Police Unified Communication and Response (PUCAR-15) Service for Punjab Police in 35 Districts

iii. Policy and Practice Analytics

iv. Police Integrated Intelligent Counter Surveillance

v. Intelligent Traffic Management & Electronic Traffic Violation Management Service

vi. Media Monitoring and Public Information Service

vii. Electronic Evidence Management

viii. Lost & Found Service

ix. Advanced LTE Telecommunication Service

x. Urban Infrastructure Information Service for non-Police Departments

xi. Complaint Management Service for Provincial Police Office

xii. Training and Capacity Building

xiii. Software Development and Implementation for Punjab Police

4.2.1. Police Integrated Emergency Response System (PIERS):

The emergency calls land at Police Emergency Call Centre (ECC). The information & consultation requiring calls are responded promptly. However, in case of any help required, the case is transferred to DCC (Dispatch Control Centre). DCC then transfers the case to the concerned police station (**Annexure - IV).** From 2017 to 2019, 12.25 million calls have been received on 15 and proactive response is of 537,397 which means that Police rapid response forces have responded without any complaints but through observations of PCOs by surveillance activities (Khan, 2018).

Due to the availability of first responders of Dolphin Motorcycle Squads, Police Response Unit cars, Traffic Police Responders, operational vehicles of Police Stations, Fire Fighting units and other Rescue 1122 services integrated emergency response is possible.

Table 1. Police Integrated Emergency Response System (PIERS-15)

1	**Emergency Calls Received in Punjab**	**PKR 20.43 million**
2	Response Duration	24/7
3	Dolphin Squad	3200
4	PRU	520
5	1122	350
6	Fire Brigade	60
7	Social Media Response Rate	71%

According to available data from 2017 to 2019, PIERS response time is from 10 to 12 minutes on an average in Lahore.

Table 2. PSCA – Operational Performance 2017-2019

Rapid Responders	Average Police Emergency Response Time	10-12 Minutes
Police Response Units		
Traffic Police Responders		
Operational Vehicles		
Ambulance Service		
Fire Fighting Units		
Other Emergencies		

Punjab Safe Cities Authority has designed and implemented interoperability across Police, para-military forces, Armed, other law enforcement, emergency services, intelligent agencies and local government organisations to streamline operations and provide valuable services to the citizens under one roof and a joint operational platform. A reference of last three years of calls of Lahore and first year of Punjab is provided in the **(Annexure - V).**

The perception surveys and global crime index are better ways to make any assessment about performance of PIERS. However, this does not provide

any perception from the Police itself about the change management process and its impact on their daily work or attitude of public towards them.

4.2.2. Police Unified Communication and Response System (PUCAR-15)

To bring change in the Punjab Police culture, structure, people, processes and which enables integrated emergency services like Unified Command and Response (PUCAR-15) and Police Grievance Redressal Helpline 8787. PUCAR-15 is a province wide system operational in all 35 districts of the Punjab for a population of 120 million people. Main purpose of PUCAR -15 and Lahore based PIERS is to provide immediate assistance to victims of crimes and emergencies of all types including accidents, medical, fire and others with rapid response by First Responders Police Units (PRUs) and to provide all kind of emergency services by integration of all emergency service providers. This is the most successful and the most frequently used system of PSCA so far in addition to other service modules of PSCA. Details of PUCAR-15 data for this first 09 months is provided in **(Annexure - VI)** for understanding the scope and granularities covered through this landmark system of PIERS at provincial level.

4.2.3. Policy and Practice based Analytics - Heat maps:

Punjab Safe Cities Authority generates Crimes Heat Maps of all the six divisions of Lahore district along with analysis reports that helps in developing strategies for crime reduction in the city. This analysis is conducted daily, weekly and at any time span in which data on received calls from public is being analyzed for seven different categories of reported crimes/incidents against property. A spatial analysis of reported crimes based on the jurisdictions of all Police Stations of Lahore is carried out.

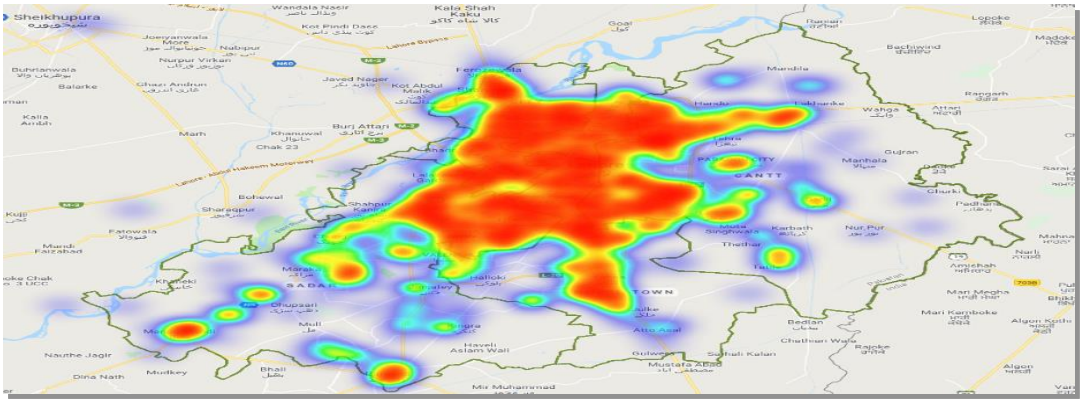


Figure 5. Heat Map based upon Calls Received on PIERS 15

The heat map hence generated depicts the Police Stations that are prone to high crime in their jurisdictions. Furthermore, a temporal analysis is also conducted depicting the crimes incidents with respect to their occurrence. Heat maps made from this data helps in identifying the shifts in which more crimes are reported and optimize the duties of police force accordingly. The said heat maps and analysis reports are shared with the Inspector General Punjab and all concerned officers of Punjab Police.

Due to the initiatives taken by the authorities 43% reduction in calls related to property crime has been observed (General, 2019; Sheikh, 2019) Moreover, data shows that there is 17% decrease in street crimes in Lahore (News, 2018) Traditionally, the police priority are calls related to dacoity, kidnapping, murder and burglary which counts not more than 3-5% in total crime. PUCAR-15 is showcasing the near to real picture of the crime occurring in the region. The consult and information seeking calls are responded at the same time however, PRUs for help are dispatched to the caller and at the same time information is also shared with concerned police station simultaneously for prompt response. The analysis has been done from macro to micro level. It is a spatial as well as temporal analysis to assist the Police in designing their patrolling pattern as well as to gather intelligence where it has to focus on a particular type of crime calls. These best practices are implemented in order to bring in new revolutionary police culture. Number of cases and their response time have been observed from divisional to

police station level, so that work performance in a hierarchy can be evaluated.

The impact of this change is becoming visible indirectly. World Crime Index managed by www.*Numbeo.com* which is an international website to measure the crime index based upon various indices. Rank number 1 being the worst on crime index as per public perceptions, Lahore has improved from 138 ranking in 2018 to 201 at the end of 2019. This shows a significant change in perception of Lahore Crime index and it is an indirect evidence of improvement in crime situation of Lahore (Mladen, 2009).

Table 3. World Crime Index

2018	2019	Current
138	201	243

This is not the only index or measure of performance of PIERS but it is a positive sign for the Police performance in Lahore.

4.2.4. Police Integrated& Intelligent Counter Terrorism Surveillance System (PICTS):

With the help of Police Intelligent Counter Terrorism Surveillance System, PSCA is able to access and share information within the Punjab Police units as well as external civil and military agencies to ensure speedy service delivery for an effective and coordinated response. It includes approximately 8000 IPNV cameras, 110 vehicular cameras, 6000 handsets enabled cameras, Face recognition system, Vehicle Tracking System and Excise Taxation and Narcotics Control Department of Punjab and National Database and Registration Authority (NADRA) database to access and confirm the identity of citizens and residents in Pakistan. It also includes data of vehicles registered in the province of Punjab, Khyber Pakhtunkhwa and

Islamabad Capital Territory for surveillance and Electronic Traffic Violations Management purposes.

Table 4. Integrated Intelligent Counter Terrorism Surveillance System

1	**IPNV Cameras**	**8000**
2	Vehicular Cameras	400
3	Data on handsets	6000
4	Watch Lists-FCL&VCL	
5	30 Days Recording	
6	Face Recognition System	
7	Vehicle Tracking System-Excise Database	
8	NADRA Access System	

There are dedicated resources monitoring surveillance cameras 24/7 in the PPIC3 Centre Lahore for preventing any criminal and terrorist activity through a robust operational business plan under the supervision of police officers. It also includes representatives of various intelligence agencies who are disseminating threat alerts received from National Counter Terrorism Authority (NACTA) and counter measures are being taken in real time. All the major events such as International cricket matches, religious procession of various nature and communities or large-scale operations like Election monitoring has been monitored and successfully held through the PICTS.

4.2.5. Police Intelligent Traffic Management System (PTMS):

Police Intelligent Traffic Management System is based upon technology derived from advanced IT tools to manage traffic in city of Lahore. This PTMS informs public about the live traffic situation and alternative routes through Variable message signs (VMS) displayed in various key locations in the city. Another major component of ITS is Red Light Monitoring System (RLMS) which is installed to captured red light violations at the signalized intersections. Intelligent signal controllers are installed at signalized

intersections. These signal controllers are working with different time intervals of the day plans to adjust signal timing automatically on the basis of traffic flow, by using traffic sensors also known as Video Vehicle Detectors (VVD).

Table 5. Intelligent Traffic Management System

S,no	Equipment	Numbers
1	Signal Control System	128
2	Variable Message System	68
3	Public Address System	300
4	Journey Time Management	76
5	E-Ticketing (ANPR) Cameras	1050
6	Speed Monitoring Radars	271
7	Pedestrian Crossings	66
8	Radio FM 88.6	24/7
9	PSCA Web Tv	24/7

All these components in a one unit provide safe and smooth flow of traffic in the city and also imposed fines on traffic violators through E-Ticketing/Challan System.

PSCA has introduced a public awareness system, where public is informed of traffic density and alternate routes through broadcast on Safe City Rasta FM 88.6 and PSCA's social media pages. Moreover, PSCA is issuing E-Challans using 1050 ANPR cameras to detect traffic violations. During this pilot phase, 1,452,972 E-Challans have been delivered since 23rd September 2018 till December 2019. A sum of PKR 241 million as E-Challan payment has been received till 2019 in the exchequer.

PSCA is keen to devise adequate solutions to the congestion and traffic issues in Lahore. Due to these initiatives 66% reduction in traffic violations

has been observed whereas about 25% of travel time has been saved for road users because of smooth flow of traffic and lesser congestion.

Table 6. E-Challan Details

E-Challan Delivered (From 23rd Sep. 2018 - Dec 2019)	1,452,972
E-Challan Paid	618,544
Revenue Earned	241 Million
Revenue Unearned	761 Million

Punjab Safe Cities Authority aims to ensure safety to all the citizens travelling in the city. Since the installation of Safe City cameras and the beginning of E-Challan system in Lahore, there is a significant decline in the numbers of accidents reported i.e. reduction in road accidents pertaining to head injuries and 33% less fatalities are reported through public calls received on the PIER system of PSCA.

Due to various perception surveys conducted by the PSCA, interesting results were received. It was estimated as a result of a study in 2018 that cost of congestion in Lahore is Rs 94 billion for one year (TheNation, 2020). After introduction of E-Ticketing system, PSCA was able to reclaim the traffic flow. As per a perception survey of PSCA, 82% of the respondents were of the opinion that they are saving at least 30% of their time on daily basis due to smooth traffic and less congestion in traffic flow. 91% of the people expressed satisfaction over the performance of E-Ticketing system (Nation, 2020).

World Traffic Index managed by ww.*Numbeo.com* which is an international website to measure the Traffic Management based upon various indices as per public perceptions, Lahore has improved from 31st ranking in 2018 to 76 at the end of 2019 (Mladen, 2009). Where number 1 ranking is regarded worst as per the website, this shows a significant change in perception of

Lahore Traffic index and it is an indirect evidence of improvement in traffic management of Lahore as a direct impact of PPIC3 Centre.

4.2.6. Electronic Data Analysis System (EDAS):

Through Electronic Evidence and Data Analysis System, evidence is collected & preserved in a safe custody having earmarking of evidence within a sealed security bag. All the playbacks for investigation/inquiry/intelligence/trial can be accessed and shown in "Electronic Data Analysis Centre" by the Investigation Officer or the Authorized Officer, with the permission of competent authority or the law officer. Evidence is preserved for the period of 07 years and it is admissible in court under section 164-A of Qanoon I Shahadat Ordinance 1984 earlier known as the Evidence Act (QSO, 1984).

PSCA is pioneer in Pakistan to devise such legal procedures for collection of evidence and ensure lawful custody, handling and transfer at this scale. Electronic Data Analysis Center (EDAC) is designed to manage this process as per a lawful process to assist investigation and prosecution in a transparent manner ensuring a balance between security and privacy of persons and data. Details are attached in **(Annexure- VII)**.

PSCA has also developed first Data and Privacy Protection Procedures (DP3) for the protection of privacy rights of the people in 2020. DP3 is developed after a consultative process with other stakeholders of legal fraternity and experts of jurisprudence. This is first of its kind procedure in Pakistan and it is being implemented in letter and spirit. This combination of policy and practice makes it a suitable case study for policy makers and experts of surveillance.

Table 7. Evidence Collection

1	Safe Handling
2	Earmarking of Evidence
3	Authorization of Sharing
4	Evidence Locker – 7 Years
5	Special Events Record
6	Digital Forensic Analysis
7	Admissible in Court under section (QSO-164- A)

4.2.7. Media Monitoring and Public Information Service:

Punjab Safe Cities Authority has a dedicated Media Monitoring Center (MMC) to perform tasks such as monitoring and coordination with Pakistani electronic, print and social media streams. This center works around the clock and is primarily responsible for reporting national and local media activities. MMC observes news from various segments such as Politics, Law & Order, Crime, City News, Social Media Regulation (Objectionable IDs, pages and profiles). Around 4164 links being reported to Pakistan Telecommunication Authority for having Sectarian and Anti-State content have been blocked so far. Details are attached in **(Annexure-VIII)**.

4.2.8. Lost and Found Service

Similarly, the Lost and Found Center at PSCA is primarily tasked to record and connect all missing and found reports from across the city so as to reunite lost persons, items or articles with their origin or, at least, delegate the information to the concerned Police Stations, in addition to ground teams, for an organized or swift recovery. Till date 199 children and 3183 vehicles have been recovered by the Lost and Found Center. This is novel use of surveillance cameras for improvement of public safety for children, mentally challenged persons and even for finding the pets.

4.2.9. Advanced LTE Telecommunication Service

One technical component of PPIC3 is provision of LTE-A based telecommunication system for Lahore. This is first major intervention in Pakistan security forces after 1970s. This enables fastest data transfer in audio, video and text forms and it is one of the world's best systems for mission critical communication services. LTE-A technology-based handsets are being

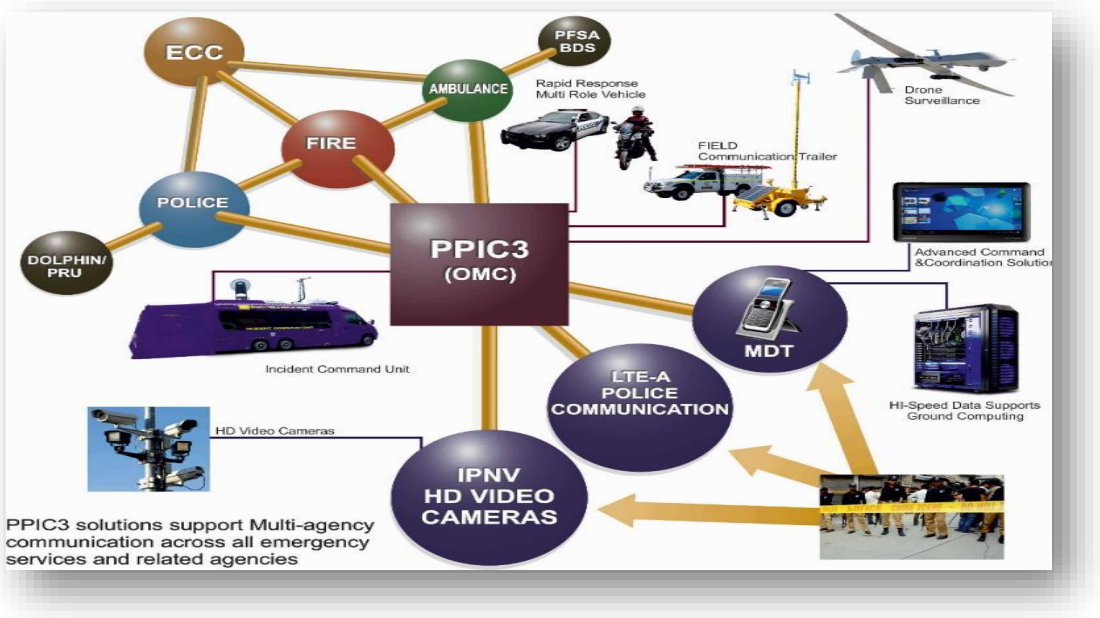


Figure 6. PPIC3-Advanced LTE-A Telecommunication Services

used by Lahore Police and these are in demand from the users due to excellent voice quality and reliability. Challenge of training of 5000 police officers and making them accustomed to such an advanced system has been overcome with the help of dedicated telecommunication team of PSCA. LTE-A is faster than existing commercial 4G networks and have higher capacity and speed. In PSCA, LTE-A network work as back bone for network application.

i. Around 4200 wireless handsets have been distributed to different law enforcement organizations that uses LTE-A network for secure

and robust communication through P2P (Point to Point) and Audio/video calls which improve the response time.

ii. LTE-A wireless network is also used as backup for some of the camera's installed on sites. Places where fiber cannot be installed LTE-A network work as a backbone to real-time video stream of cameras. It is also used as third level redundancy for some cameras installed at key sites.

iii. Police Response Unit (PRU) and Police Single Cabin (SC) vehicles have cameras installed for surveillance in mobile condition. All these cameras use LTE-A network to provide real-time stream.

iv. Through Computer Aided Dispatch system, whenever the case is generated through 15 call, a hierarchal system has been implemented which send the case though SMS on LTE-A wireless handset to high officials and concerned officer.

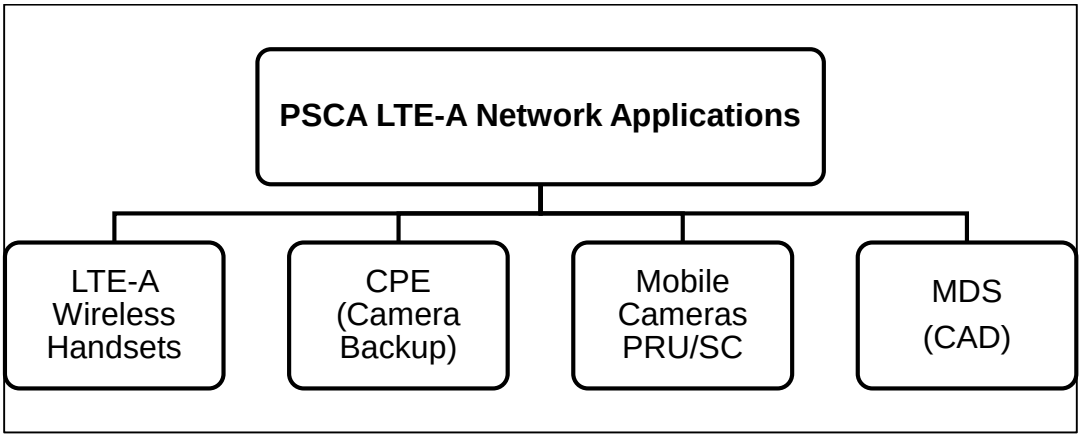


Figure 7. PSCA-LTE-A Network Applications

4.2.10. Urban Infrastructure Information Service for non-Police Departments

In addition to Police surveillance, PSCA is also providing information services to other departments periodically. PPIC3 Centre observes through cameras and reports to the relevant departments on diverse matters like the dilapidated conditions of road network, electric wires which may be a safety hazard, solid waste in public places or any leakage of water or sewerage in

streets and roads. In this way PPIC3 Centre is providing surveillance information on daily basis to other departments for urban infrastructure and where improvement is required. This is over and above the original scope of the project and an additional benefit of the system.

4.2.11. Complaint Management Service for Provincial Police Office

As PSCA has developed expertise during the execution of the project so additional work is being carried out by PSCA Teams. The establishment of a functional call centre by PSCA is now also used for managing complaints against Police through 8787 and by the Police officers who face problems in their official work. Every day approximately 5000 calls land in the call centre at a dedicated number of 8787 and people register their complaints for resolution by the internal accountability bureau of Punjab Police. Details are attached in (**Annexure- IX)**.

4.2.12. Training and Capacity Building

As mentioned earlier, it is of vital importance to build capacity of the team to deliver as per the requirements of any project. Measure of change management is presence of a functioning PSCA Training facility where refresher and other courses are being conducted regularly.

In 2013 when the new government came to power, it was time and again mentioned at national level that Pakistan lacks the “capacity” to achieve the targets for institutional development (A. Khan, Wajid;, 2019; Zafar, 1999). In case of Police, it was mentioned time and again whenever Police was struck with a crisis of any nature, whether it was handling the issue of attack on Karachi Airport in 2014 (Jillani, 2014) or an attack on Army Public School in Peshawar (Khalil, 2014). PSCA management was also facing the same question: will it focus on capacity building of existing resources of Punjab Police personnel or make any other decision. One help was provided through

decision of the Chief Minister of the Punjab that altogether fresh officers will be recruited to run the PPIC3 Project with higher educational requirements i.e. each officer shall be holding minimum a bachelor degree in IT related field. This decision was implemented with lot of deliberations but there was no precedent available about a training regime of such resources.

First key decision was recruitment of a new cadre of Police Communication Officers. PSCA recruited 666 such officers in phases. First batch was 326 officers and training them in a short period of time was a practical challenge as they were supposed to do a job which was not done in Pakistan before them - running an integrated command, control and communication centre of Punjab Police. PSCA management, after due deliberations, decided to adapt a new model of outsourcing the training of these officers. A new curriculum was developed under the guidance of the project team and in consultation with senior and experienced training experts. Methodology of the training was developed and implemented under the guidance of PSCA Business Change and Capacity Building Unit. There were two tiers of trainings.

i. Police Induction Training Program - Two Weeks
ii. Life Skills Training Program - Two Weeks
iii. Technical Training - Four Weeks
iv. Police Profiling and Surveillance Training - Two Weeks
v. International Trainings for Technical Experts of various domains

In addition, in-house refresher courses were also arranged for managers. Officers were also encouraged to conduct online courses and international trainings were also conducted. Details of such trainings are provided in (**Annexure -X)**.

4.2.13. Software Development for Smart Policing

PSCA has its own software house. It has developed 35 applications and systems with the help of in-house team. Services by the trained and specialized human resource are now contributing for capacity building of Police in all Pakistan. Details of in-house software are provided in **(Annexure - XI)** for reference and to understand variety of software developed for governance of PPIC3 Centre Lahore specifically.

4.3. Change Continues

PPIC3 Center Lahore is the pioneer pilot project of PSCA. Considering the reduction in crime and improvement in traffic management and public support, Government of the Punjab and PSCA is planning to establish PPIC3 centers in 10 other cities of Punjab namely Rawalpindi, Faisalabad, Multan, Bahawalpur, Sargodha, Gujranwala, Dera Ghazi Khan, Nankana Sahib, Kasur & Sheikhupura.

	PPIC3 Projects	Current Status
	Rawalpindi	The Project is approved from the PPP Steering Committee. The Project will be executed on ADP 2019-2020 approved by the Cabinet.
	Kasur	Completed
	DG Khan	PDQ has been floated on International & National Newspapers.
	Multan	Frame structure of PPIC3 Centre has been Completed
	Bahawalpur	Frame structure of PPIC3 Centre has been Completed
	Faisalabad	Frame structure of PPIC3 Centre has been Completed
	Sargodha	Frame structure of PPIC3 Centre has been Completed
	Gujranwala	Frame structure of PPIC3 Centre has been Completed
	Nankana	Approved in 27th meeting, waiting for the release of funds from the Cabinet Standing Committee
	Chunian, Pattoki, Phoolnagar & Kanganpur	Pending Funds

Figure 8. PSCA Future Projects

This will enhance the security, efficiency, reliability and harmony of the citizens of Punjab by allowing them to live in a safe and secure environment.

The Safe Cities Project of Lahore and subsequent projects will help to realize the vision of ensuring safe, peaceful and prosperous cities in the province of

Punjab. Various components of the project have even direct linkages with Sustainable Development Goals of UNDP.

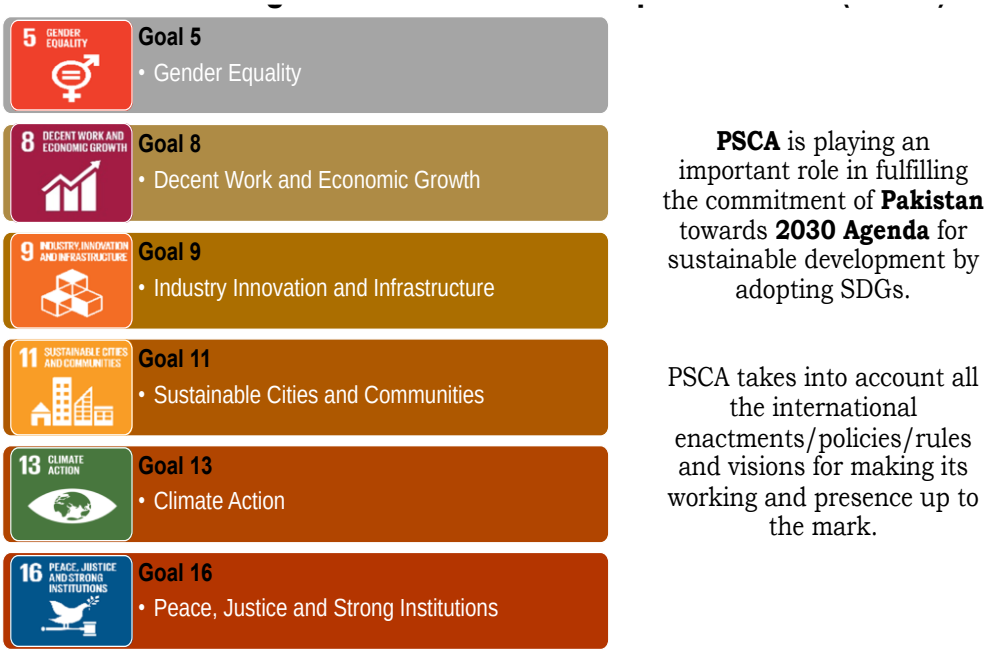


Figure 9. PSCA Working in Sustainable Development Goals (SDGs)

The development of PPIC3 Center is seen as a success by many not only for the citizens but also for the long-term prosperity of the province (Nation, 2020). Beyond a secure urban environment, the project will boost economic growth by attracting foreign investment and generate employment opportunities in the technology-driven security sector.

However, there are a number of issues around implementation of mega projects and it is important to analyse the change implementation and management part before expanding the scope of the project and recommending it for replication in other settings. Next chapter 5 deals with this change management and lessons learnt through this project in real life.

Chapter 5
Change Management and Early Impact

It is not easy to develop an innovative mass surveillance project at such a mega scale in Pakistan and there are very few other examples with such level of complexity and creativity (Hoggett *et al.*, 2019). Pakistan Planning Commission also takes interest in learning lessons from the good or bad experiences of the projects at provincial and federal level (Hoggett *et al.*, 2019).Some of the lessons learnt through implementation of PPIC3 Centre as a surveillance project are mentioned in (**Annexure - XII).**

5.1. PSCA & Change Management

Establishment of first PPIC3 Centre of Lahore is a significant change that will impact all segments of policing in Lahore and even other allied departments. Effective change management require long term, sustained commitment at a senior level on behalf of the identified stakeholders, departments such as Punjab Police, Punjab Excise, Taxation and Narcotics Control Department (ET&NCD), National Data Registration Authority (NADRA), Finance Department of Government of the Punjab and others. Scope of the technological modules are mentioned in (**Annexure - II)** but implementing the change and execution of the PPIC3 Centre Lahore project was another story. Literature on change management reveals that maintaining focus on timely delivery of quality standards has three pre-requisites (Cels *et al.*, 2012; Llopis, 2014):

i. Owners of Change - Political ownership for the change management with active and regular participation during implementation process

ii. Champions of Change - Strong leadership at Operational Command Unit level (PPIC3) to unite and integrate the newly formed team

and maintain focus and commitment for continuous improvement and delivery

iii. Agents of Change - empowering the change agents who will actively lead the change at operational level through open communications and support from all contributing bodies undertaken with integrity among all stakeholders (Haider, 2018; Johnson, 2015).

Based upon these pre-requisites a detailed strategy was required which included the following, among other things:

5.1.1. Police leadership commitment and ownership

Effective leadership for change management by the key stakeholder is critical for success. Committed leadership will embody and communicate the vision for success throughout the development lifecycle and even after (Hoggett *et al.*, 2019).

First requirement is availability and then quality of leadership to bring about any change. Sometime, great ideas cannot see light of the day because of lack of ownership by the leadership. Availability of committed leadership is a key requirement for any change management. They become champions of change. Second requirement is security of tenure. It is quite possible that in innovative projects, cost, time and scope are misjudged. In public sector of Pakistan, security of tenure is a major issue and highlighted by experts (Haider, 2018).

It was ensured by keeping the same team leading the PSCA as Managing Director and Chief Operating Officer were not transferred by the Police despite serious attempts by other stakeholders and spoilers. On the part of the officers, they also showed their commitment by not asking for much more “lucrative” positions as per the local definitions of a “good position”. Second most important development was continuous evolution of team and

new roles which can be gauged from changes in the organograms during the execution period of the project **(Annexure - XIII).**

5.1.2. Shared vision and values

It is a fundamental question to ask from the organizations which undergo change about the vision and values they espouse. If there is no real demand from within the organization, it makes the efforts less worthy and more difficult to implement (Ingólfsson, 2019).

The organization's leadership has articulated a clear capacity and willingness at organizational level to make the change successful. That capacity and willingness has helped to overcome resistance and set a benchmark for service excellence. In PSCA, although acceptance of the project developed with the passage of time, but there was huge resistance from the very people who have the responsibility to implement it above the management. This threat was neutralized, to a large extent, through political ownership and public support. For getting both, there was need to have a clear strategic communication plan and skillful execution which was done by regular interventions and bringing positive small changes and successes for the public. Despite political changes in the government, public support proved key for sustainability of the project because the project was delivered without any political gains by the team, and most importantly no compromises were made with regards to standards of transparency and fairness (O'Hara, 2011).

5.1.3 Continued respect for best practices

Normally, it happens that patience level is low in organizations undergoing change due to multiple factors like fear, uncertainty and resistance. Respect for learning from others and stamina to follow that constantly is key requirement in change management (Taner, 2007).

PPIC3 is designed to build on lessons learnt from the past, international best practices where available, altering what undermines the vision and skill creation along with experience and knowledge that has previously served the Punjab Police. In that case it was important to keep implementation of the changes on a constant path without being discouraged by the initial negative feedback. One such example was the fear that increased representation of women in the work force of PPIC3 will have a negative impact on the performance. This was ignored, and the results have illustrated that it was a traditional excuse and had more cultural leaning than scientific evidence to support this proposition (Grown, 2005).

5.1.3. Empowered Change Agents

In response to change leadership, change agents will define and embed the required behaviors for PPIC3 success. To achieve this end, they will be offered proper training and mentoring.

Relevance of the above strategy steps can only be ascertained if change agents are empowered to bring changes and keep tweaking till they reach an acceptable balance as well as a stability point within the organization (Paludi., 2008). It is subjective in a way because it is assessment of the change agent to set the bar of satisfaction or level of change. However, with continuous efforts it can be adjusted to higher or lower standards.

Human resource department of PSCA was facing issues of unauthorized absence as well as accumulation of leaves at the end of year 2018 where 10% of the employees have been facing this issue and penalizing all of them was not only a legal challenge but also a demotivating factor. By change in policy by the Chief Administration Officer of PSCA, to allow for encashment of un-availed leaves and penalizing unauthorized absence to an astonishing low number of unauthorized leaves came down to 1% in 2019.

5.1.4. Motivated Team-Working

PSCA *is an aspirational construct – harnessing advanced technology to support the best officers in delivering excellent service to communities across Punjab. It is not possible to achieve such results within and less supportive enabling environment for Police. Motivation of the team is main responsibility of the top management and if a team feels not important or duly compensated, it is hard to get the desired results especially in innovative projects like PPIC3 Centre Lahore* (Government of Punjab, 2017).

A heterogeneous team from a variety of command structures has been put together for creation of effective inter- and intra-team relationships. Various activities were designed to keep the team motivated. Both monetary and non-monetary motivation strategies were implemented to keep the team motivated (Mukama, 2019). An appeal for public service remained a constant force however, where team members found that they have much higher monetary incentive available outside the organization, they preferred to leave the organization but after completing their primary targets.

5.1.5. Consistent Communication

Effective two-way communication strategy through consultations, brainstorming sessions and briefings to ensure that ignorance, confusion, fear, apathy or resistance are addressed before they de-rail the change process (Stephens *et al.*, 2011). *A firm commitment to listen to stakeholders as well as inform them is an integral part of communication activity that regularly takes place throughout the implementation of the project.*

Many times, implementation of a law into practice is missed in Pakistani context. However, in this case, the legal bodies formulated by law were activated as main legitimate and lawful tool of stakeholder engagement. It

was proved successful because there were 27 meetings of the board of Authority and 31 meetings of Executive Committee and almost 40 meetings for implementation of the project in addition to multiple daily meetings with the implementing teams of contractor and consultants. Many policies and decisions were taken on the basis of stakeholders' perspective. However, having platforms to raise concerns and to address them through a process was useful practice.

5.1.6. Effective Training and Capacity Building

One of the most significant aspects of complex change management is the capacity building Programme and its successful implementation on which the success of integrated security system depends (Mento *et al.*, 2002). *Skills development as per the intended tasks is basis requirement.*

First key decision was about human resources selection: either they should be existing Police officers with similar training and recruited through same process or not. Decision was taken in consultation with the Authority to have a new work force which must have higher education qualification as well as higher salaries. Following this, as *first* step, PSCA management designed a complete Human resource plan encompassing method of recruitment, training, skill development, technical and social management trainings of the 666 Police Communication officers - a new cadre in Punjab Police who were graduates from any recognized university of Pakistan. *Second* most important decision was inclusion of females at much higher rate than any other Police service in any of the provinces. *Third* decision was inclusion of young persons from across the province of Punjab for inclusivity of youth across the province **(Annexure -XIV)**.

This resulted in an inclusive work force with more than 20% of females, well-educated and trained through a private firm which was motivated to deliver. Even the gender mainstreaming of PSCA was a major shift from capacity

building and inclusivity perspective at national level **(Annexure -XV)**. Similarly, PSCA developed a team of experts from private sector and imparted training to them locally and on international forums to prepare them for the work in hand.

PSCA developed its own capacity by hiring international consultant firms in engineering, IT, Video streaming, networking, telecommunication and traffic management to mention a few. PSCA staff was attached with the expert for on the job training and within three years, PSCA has its own national team to deliver other projects without any external technical support from any organization. In fact, now PSCA is providing support to other provinces for establishment of IC3 centers. PSCA is pioneer in providing such level of expertise to any other public department in Pakistan.

In addition, the operations of Lahore Police and many other organizations were expected to undergo major changes and capacity building programs before, during and after the implementation of Safe City project. Standard operating procedures were designed and implemented after getting benefit from international best practices. The plans were also verified and approved by the experts from modern police forces of London Metropolitan Police Service where it was relevant. In many cases, there were unique SOPs as PPIC3 Lahore is a project of its own type and complexity.

At least 5000 Police officers were trained on new telecommunication system and more than 4000 officers were trained for use of various applications for emergency response and for a new business model. Police officials who are accustomed to conventional ways of policing also needed to be acquainted with the modern operations of an integrated security system and its advantages to fully realize the positive impact of this system on prevention and control of crime. Moreover, training programs are planned to motivate the security officers and facilitate their adaptability to the new

system. The benefits of the system flow from a shared responsibility on the part of all key players in the security environment.

5.1.7. Stakeholders Engagement

Stakeholder engagement strategy incorporates the identification, analysis and engagement of individuals who have a direct or indirect role or stake in the existing or changed process (Seow *et al.*, 2006)*. In general, a collaborative approach, based on mutual understanding of needs and concerns is required. Some indirectly involved stakeholder may become spoilers. This leads to a shared understanding of the stakeholders' aspirations and allows the change management team to map and support the stakeholder objectives that are linked to the success of the project* (Freeman *et al.*, 2007).

No program of this scale and significance can succeed without the support of the stakeholders. Therefore, a comprehensive stakeholder engagement strategy has to be in place to apprise them of the new processes and systems and to address any risks which may arise due to insensitivity about needs of other stakeholders (Husted & Allen, 2010). However, it is not always as positive as it seems.

Conflicting interest, complexity in doing public and private sector, structural inadequacies and at personal level egos, sentiments, negative competition and organizational turf wars also come in the way of managing the change. The implementation process involves the relevant stakeholders at the right time to ensure their commitment and convergence towards the identified benefits – and the long-term vision being realized. Comprehensive communication plans were developed along the execution of the work to bring the general public on board. Exclusive meetings with all stakeholders including Army, Police, academia, media and other actors of criminal justice system are already in progress.

However, in reality, the stakeholders who had different motives from organizational level to group to personal level, kept on playing their traditional roles in public sector of Pakistan. In order to cross the hurdles, most important support came from the office of the Chief Ministers who were owners of change and from the political leadership (Paryani, 2011). Other stakeholders weighed their options and when they found that political support is there, they followed the directions of the leadership and most of the objectives were achieved. Where there was dwindling support from political leadership, bureaucrats and sometime Police officers at the helm of affairs resisted the change.

The political support has not come without a price. Extra work, and at times, persistent effort to follow the merit incurred the wrath of the political heads but at that time other stakeholders from Police and bureaucracy came to support the change process. The engagement has to be at personal, group, organizational level to achieve the targets without compromising the standards and legal requirements (Christiansen, 2002).

5.1.8. Communication Strategy

An effective communications strategy is essential for the success of the change management through all possible means and keeping it as a corner stone of all activities throughout the project timeline (Steyn & Nunes, 2001).

PPIC3 Centre Lahore is not just a new call handling and dispatch center. It is a whole new model for operational policing. The supporting information technology systems enable intelligence led response to emergency calls and the supporting systems enhance the capacity as well as enable senior management to better respond to terrorism, militancy, protests and emergencies.

Factual and honest communication paves the way of winning confidence of the stakeholders (McPhail, 2010). A successful transition to the new way of working requires the benefits of the new system to be marketed to all staff. The staff operating at the PPIC3 Center as well as in the field was apprised about the impact of the project and on their role and mode of working. The transition into the new system was facilitated through modern training and skill development of personnel.

The change management of the PPIC3 Programme was hinged upon an effective communication of these messages at all levels both vertical and horizontal; from the upper echelons to the foot constable patrolling his beat (Trojanowicz, 1986). The public expectations were also to be managed through a sustained public information campaign launched to meet this end (Wakefield, 2006). This job was done by media monitoring cell and as project director was dealing with media relations and communication strategy through electronic, print and social media. Various news programs were also organized to make the public aware about the project developments and changes coming through the system.

Another theme was to invite the dignitaries and people from show business and national sports persons to showcase the project and their arrival also attracted media and public engagement was increased. The most important stakeholder always remains the public and media is the bridge to reach out to the public and inform them about changes which are already taking place and which are in the pipeline. However, before any communication strategy, there was always substantial work done to inform the people.

5.1.9. Expectations Management

While communicating with stakeholders and wider audience it is important that their expectations are neither too low nor too high. In either case, the change neither gets approval nor can it sustain. Process of change may

have a definite starting point, but defining its end point remains a difficult task. In that case, it is important to set some benchmarks or milestones to achieve so end points and exit strategy could be crafted (Butt *et al.*, 2016).

Through the establishment of the PPIC3 Centre and working of Lahore Police, it is envisaged in the planning documents that approximately 20 percent of crimes such as rioting, destruction of public and private property, 28-30 percent of vehicular crime, and 15-20 percent reduction in crimes against property such as house burglary, robbery, street crime will be achieved in the first five years of successful operation. It needs to be augmented with the newly developed Dolphin Police Motorcycle squads comprising 500 motorcyclists and 110 Police Emergency Response Unit (PERU) cars patrolling their beats throughout Lahore.

5.2. Role of Capital City Police Lahore (CCPL)

The traditional form of policing has largely remained the same for over a century and same age-old processes are imbibed by the Police officers and leadership in Pakistan (Suddle, 2003). Police by design and mandate is required to enforce laws and it is designed to train people on a set of principles and skills which take time to mature. The repetitiveness of the functions without innovations is considered expertise and encouraged by the Police leadership. In addition, in British India and then in Pakistan and Bangladesh, recruitment level for officers at junior level were not supposed to be highly educated and imparting them education and training to them had been a low priority area for Police commanders. In this backdrop, the main challenge was transition from the conventional methods of policing to more advanced, technology-oriented policing (TOP) that the PPIC3 center embodies.

For this purpose, the pro-active involvement, interest and ownership from the Capital City Police Lahore was the determining factor for the success of

the program. It was clear that it would take consistent and constant focus to enable the necessary change that was required for this transformation. Lahore Police was the target of this change and being the largest Police district of the Province of Punjab, it has high visibility for media and communication. Implementing a pilot project in the second largest city of Punjab with a population of 11.1 million people (Khawar, 2017; Tribune, 2016) and hub of political economy of the Punjab was not an easy target set by the political leadership. However, to showcase the political will to vitalize the Punjab Police and change its culture was the priority of the political leadership behind selecting Lahore as a pilot safe city project (Raza & Mehmood, 2014).

At operational level, Lahore Police had to provide active logistics and operational support to try new systems and methods in a live environment. It was political ownership which pushed the Police leadership of Lahore because they were resisting any change for multiple reasons. Chief of Capital City Police Lahore was also a member of the important committees of the Authority as a participant as well as a key stakeholder in the project.

Lahore Police resisted the change in passive and active manner. Initially human resources were provided by them but with lot of efforts and resistance. Similarly, when it came to enforcement of traffic management and Electronic Traffic Violation Management System, locally known as E-Challan System, Police resisted as modernization in Policing was presented as an encroachment on their functioning and their mandate of traffic violations management. These are only two examples to mention how the most modern techniques and technology remains unexploited if stakeholders are not ready to implement the change. This happened at a time when the political leadership was changed as a consequence of elections and ownership of change dwindled, however, courts supported this change at that critical juncture (LHC, 2018).

The support from junior police officers was also reflection of attitude of the senior command. At times, fear of accountability through cameras, loss of discretion due to electronic evidence, fear of mistakes while using new technology, empowerment of specialist vis a vis generalist and loss in opportunities of corrupt practices alone or a combination of above factors became the motivation to resist change. In some cases, it was the lime light and public support gathered by PSCA which was igniting resistance of the Police leadership. No easy way was provided by the Lahore Police leadership to implement the change.

The benefit of such resistance was reaped by others, out of Police stakeholders, who were under the impression that their role is diminishing with introduction of technology. To quote, PSCA has evolved its own administrative and financial regulations and it was tantamount to attain more independence and functional autonomy necessary for change management (Government of Punjab, 2017). When resistance to implement technical solutions was faced from the Police, finance department and Home department also started delaying the supply of funds and kept on prolonging the issues related to PSCA (DAWN, 2020). Frivolous litigation was started against the PSCA leadership. In two incidents, one in Supreme Court of Pakistan, it took six months to win a case which was targeted to malign PSCA leadership (thenews, 2018). In another incident, recruitment process was halted for 12 months as PSCA leadership refused to recruit one person against the policies and merit. Consequently, extra work was done by the PSCA with available resources and hence remaining financially under stress during this time.

5.3. Expansion of Safe Cities Projects

The Punjab Safe Cities Authority is spearheading new standards and practices which are not paralleled by any other public sector organization in the Punjab. The authority has successfully applied innovative

approaches to bring change in all the sectors i.e. business, process, implementation and monitoring. Creative and modern practices have been explored in human resource management, professional trainings, performance management, police business change and legal framework of PSCA. Furthermore, PSCA has brought a paradigm shift towards changing the police culture through gender mainstreaming, youth involvement, Inter-agency collaboration, stakeholder engagement and ensuring inclusivity at all levels of the organization (News, 2016).

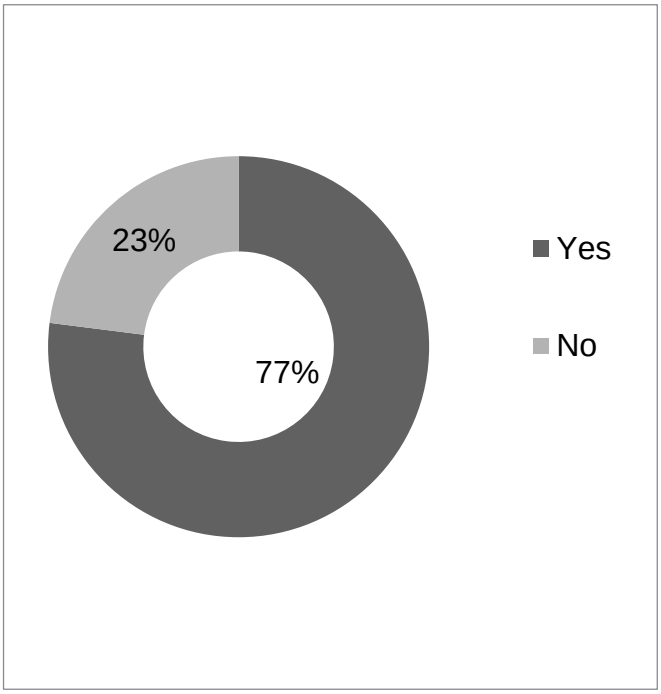


Chart 1. Do you feel secure with the installation of cameras in public places?

The project is acknowledged as a success story in public sector as a result of which significant improvement in response time of Police, successful implementation of e-Challan, reduction of crime and terrorist activities in Lahore were observed (Tribune, 2020). Moreover, utilization of technology for police investigations and security are few of the many achievements of this project. All these factors, however, improve the services from the supply side of safe city project. There is no doubt that there was higher demand for many services from the Police personnel also but most of these operational improvements and excellence is to

empower Police enforcement and in the words of a Police officer from UK, PSCA is a heaven for Police officers where they have maximum technological support available at their hands readily.

5.4. Public Perceptions about PSCA

PSCA as a consequence of this research as well and through learnt techniques of this research, has conduct public perception survey about performance of services provided through PSCA infrastructure and to gauge its early impact. Complete report is at **(Annexure - XVI)**, however some key findings are shared here which are relevant to this discussion about change management and perception of public.

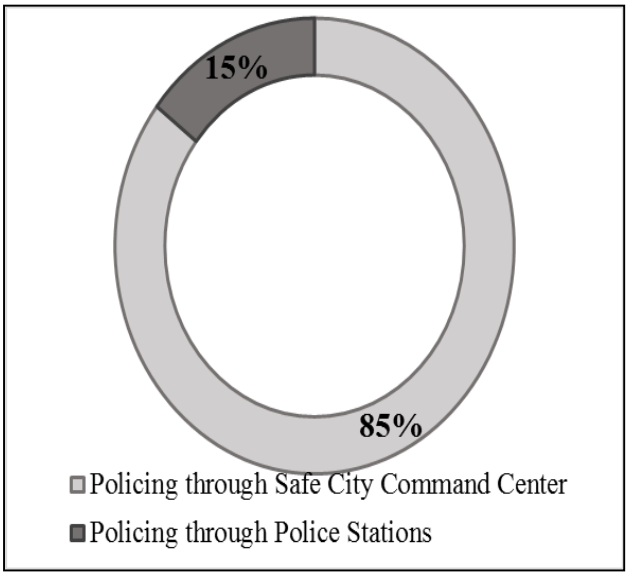


Chart 2. To improve security situation, if the Govt. has 10 crore Rupees; where would you prefer to spend?

5.4.1 Surveillance and Security

People were asked that do they feel secure with the installation of cameras in public places. 77% people feel secure with the service and 23% of the respondents don't feel secure with it. There was no data available to present that this modern surveillance infrastructure was installed on the basis of any public demand but international best practices were followed by the Police. This survey confirms the point of view of respondents of this research who trade off in favor of security at the cost of privacy. Still there are 23% respondents who have different

perception about public surveillance. No further probe was done about causes of acceptance or denial of the participants, however, this remains another area for further exploration.

5.4.2 Willingness to Pay

Prioritization of spending is key political function and it determines outlook of any ruling party. It is normally considered that people do not have a choice in spending the public money. The survey question was aimed at getting the choices of the people in this connect and two options were given whether it should be on conventional policing through Police station which needs resources or for Policing through command centers i.e. PSCA model.

In response, 86% of the respondents prefer to spend on ‘policing through Safe City Command Center’ and 16% showed their preference to spend on ‘policing through police stations’. This figure also illustrates the satisfaction of public towards Safe City Command Center. It shows the shift in trust of the people of Lahore on PSCA managed policing. Transparency in financial management, visibility of modern infrastructure, less human interaction and positive communication of PSCA may be the plausible reasons for this trust on PSCA. Given that almost a similar number of people know about PSCA, shows that it has gained confidence of people for law enforcement function of the Police. PSCA claims to be “Future of Punjab Police” so it is an acceptance by vast majority of people that this form of Policing in Punjab is a preferred choice for public spending. There is need to further propagate this aspect of Punjab Police to attract more financial resources for establishing similar command centers in other districts of the Punjab and elsewhere.

5.5. Implications for Public: Privacy and/or Security?

PPIC3 Centre Lahore is one of the most complex and comprehensive change management projects ever undertaken in the civilian security sector in Pakistan (Authority, 2015). Mere implementation of PPIC3 Centre's project is not an end in itself; rather it represents a vital step in the journey towards safer, prosperous and more empowered communities having a modern, well-equipped and an accountable Police Service. From public perspective, it could have been a huge loss of time and finances had this project not delivered as it was intended. Consequently, PPIC3 Centre Lahore project could have faced one or more of the challenges during the change management process as mentioned above. All the above factors or any one of them becomes a challenge big enough to manage the change in a given period of time. Risk mitigation strategy, like in theory, can be maintained in the form of risk registers and mitigation plan and it can help in identification of risk but resolutions and mitigation remain the leadership's task through active team support and owners of change (Muriana & Vizzini, 2017). It is also important to consider if the time taken to implement this project could be reduced to reap the benefits earlier.

The factors under discussion are based upon project management and technical oriented but some human rights dimensions and legal aspects are not addressed in this scheme of implementation. It was originally conceived that cameras and other sensors will be used to collect evidence for crime prevention and counter terrorism purposes. The legal question of admissibility of the evidence collected through these cameras was identified in time in 2016. Before establishment of PPIC3 Lahore, no state-owned cameras were used at such a wide scale so legal issues were also not raised about their admissibility and data protection or misuse of the data. Partly due to poor quality infrastructure and limited capabilities of surveillance system in Karachi and Islamabad, these issues were not raised (Abbas, 2011). Secondly, Police could not make full use of the systems nor

it was aware about benefits of surveillance systems due to multiple reasons so no demand came from Police to use or improve the existing surveillance systems.

It was resolution of some high-profile cases like suicide bombing case of February 13, 2017 when on Mall Road, 14 persons were martyred in a suicide attack (Hassan & Masood;, 2017; India Today, 2017). PSCA assisted in detection of the perpetrated in less than 48 hours due to speedy efforts of Counter Terrorism Department of Punjab Police. It was for the first time that efficiency of the PPIC3 Centre was acknowledged at the national level by the public and the decision makers (DPP, 2018).

Second incident was issuance of Electronic Traffic Violations Management system (ETVMS) in 2018 when people started receiving pictures of violations and people in the vehicles and public became aware that their data is being captured (Islamabad, 2018; Mirza, 2018). People started asking questions about clarity of evidence and also there were few incidents reported in the media that in some cases people are wary that their pictures were sent to homes and their families knew about their driving behavior as well as who was accompanying them during the drive (Warraich, 2019).

Third case was leakage of seven objectionable pictures in March 2019 (Ahmed, 2019; Daur, 2019). These pictures were intelligently captured through ETVMS; however, these were kept on desktops of some employees and these went viral on social media by some unknown persons, with certain access to these pictures (Azeem, 2019). PSCA has conducted an enquiry and three members of the team were terminated for violation of the code of practice. People became aware about seriousness about the data protection issues and privacy became a subject of discussion (A. N. Khan, 2019).

It was an outcome of this mass surveillance program of PSCA that Privacy rights became a subject in local media and in public. Hitherto, it was considered a foreign subject for the Pakistani society or it was construed as a concept related to violation of code of honor for the men in Pakistani society (A. N. Khan, 2019).

From international perspective, it was again highlighted when social networking application making company Facebook was facing allegation of data breach and using data of users of Facebook without their explicit permission (Isaac & Frenkel, 2019; Matsakis & Lapowsky, 2018; Solon, 2018). In another case in USA, it was noted that US presidential elections were manipulated by using the social media preferences of the users (Craig & Ludloff, 2011; Meyar, 2019; Newman, 2014). It was happening because data protection procedures were either violated or manipulated by the powerful abusers (Council, 2007; Pallero; & Arroyo;, 2018).

Gradual increase in use of the system, international issues of privacy and data leaks like Panama leaks (Harding, 2016) and Facebook (Silverstein, 2019) data manipulation highlighted the concerns for data protection for PSCA also. In October 2018, first major opinion article appeared in national newspaper highlighting the importance of Privacy rights in Pakistan and inadequacy of the existing legal framework. Being aware about the Privacy rights, partly as a result of this research, PSCA already has trained all the users of the system on protection of privacy issues. Electronic Data Analysis Regulations 2016 were first such framework which explained all the stages of data capturing to data dissemination and it was duly implemented and used by the criminal justice system. It was also developed keeping in sight protection of privacy rights of the people and also data protection.

PSCA has developed detailed Data and Privacy Protection Procedures (DP3) in January 2020 in line with prevalent standards of industry (**Annexure -XVII**). Details of privacy policies of PSCA were not widely

discussed with public at large nor had they any inkling how the Safe Cities systems can be abused to have an impact on their rights. However, employees of PSCA were educated and sensitized about legal, operational and cultural sensitivities of breach of privacy rights.

PSCA at its own, followed international best practices from privacy protection perspective (A. N. Khan, 2019; PSCA, 2019).· Association of Chief of Police Officers (ACPO) of the United Kingdom has devised a strategy for installation of CCTV in the United Kingdom as early as 2007 (Commons, 2008). This strategy identifies the need for:

i. Clear standards for CCTV Cameras
ii. Guidelines on registration, inspection and enforcement
iii. Training of the operators of the surveillance system
iv. The police use of CCTV system
v. Storage /volume/archiving/retention issues
vi. Emerging technologies, changing threats, new and changing priorities
vii. Partnership working with other stakeholders.

Going through each subject area given above, PSCA has deliberately abided by all the above parameters. It has not installed any hidden cameras in public of private places nor were any videos or audio data shared with any person, organization or authority without a lawful process (PSCA, 2019). Although some interested stakeholders requested for full access to viewing rights of video surveillance but it was also denied to protect privacy rights of the people and to minimize the risks of data leakage from the individual users. Other than technical and project management issues, the legal authority of installation and use of PSCA surveillance system could have been a stumbling block in completion of the project but due to timely actions in a proactive manner, this risk was minimized.

5.6. Balancing Risk Assessment and Security Investment

Surveillance system like PPIC3 Centre is essentially an expansive undertaking. Selection of Lahore as a pilot project is counter intuitive from project management perspective, however, it can be justified on the basis of information about threats and risk assessments available to civil and military authorities (International, 2020). Urban centers are more vulnerable to terrorist attacks as history shows in Pakistan where 34,114 attacks have taken place in urban centers due to the fact that it serves the terrorist organizations better than other soft targets (SATP, 2019). Lastly, results of such an act of terrorism are more devastating and from security perspective, it is more difficult to protect larger communities, diverse targets and types of vulnerabilities.

Henry H. Willis has used methodology of insurance industry and applied on intelligence challenges faced by US Department of Homeland Security (Willis & Al-Shahery, 2014).They have analyzed the data of terrorist attacks in terms of threats, vulnerabilities and consequences of the probable attacks (Randol, 2010; Willis *et al.*, 2014). The consequences are used to estimate the annual human and economic cost of such attacks. If there is a cost benefit analysis, then investment may be made to prevent the damages or consequences of threats. UK Centre for Protection of National Infrastructure uses this approach to invest on putting in measures to save loss of life and damage to public infrastructure (CPNI, 2007).

This approach may be applied but there are challenges to evaluate the consequences part of the equation. One challenge may be sensitivity of the subject of loss of life or injuries and putting a value on this loss. Although statistical value of life (SVL) can be determined as and interchangeable quantification of losses is also complex: like loss of lives or injuries into loss of infrastructure. In addition, some consequences like loss incurred due to change in behavior of people to use one infrastructure like not going a

cricket stadium where an incident has taken place few years ago. This is an increasing interest in estimating economic value of certain abstract concepts like privacy rights which may be affected by adaption of security infrastructure (Acquisti & Gross, 2009). It becomes a little controversial in European context where Privacy is considered as an inalienable fundamental human right and its quantification in economic terms is not acceptable, however, it is possible to put a tag on this right in economic terms rather than only a legalistic perspective of its assessment (Odlyzko, 2004).

For the users of security apparatus, it is relatively easy to estimate the cost of imposition of security measures especially through a one-time project like PPIC3 Centre Lahore. Nevertheless, it becomes challenging to appreciate the cost of risk assessment as a function of threats, vulnerabilities and consequences because it can be understood only when such risks are realized and quantified in terms of loss of lives and/or economic damage (La Vigne *et al.*, 2011).

It also becomes difficult to estimate losses incurred if there is change in social behavior of people who may change their attitudes and habits in response to a security apparatus e.g. if there are multiple, intrusive and time taking security measures adapted on an airport, it may deter air travelers to undertake air travel which results in loss of revenue. The overt use of security measures may be considered counter-productive and could increase mistrust on the state apparatus to secure the people (Wong & Brooks, 2015). There may be economic costs if security of a cricket stadium is too much and therefore people may not use the facility as much as they would have used it otherwise (NAP, 2019; Shaw, 2017). However, more important is how to measure impact and how to ascertain opinion and consideration of people who use the security infrastructure in the risk assessments and to accommodate their voice in designing the risk mitigation strategies and security measures to be adapted.

The protection of data and privacy concerns of the citizens in a pilot project like PPIC3 Centre Lahore is not a small development but it was a one-sided effort by a team of experts and leadership of PSCA. There is a need to investigate about the perception of public about surveillance before having such a state-of-the-art system. Following questions come to mind before initiating a detailed research and reaching out to people:

1. Were there any concerns of privacy which they might have?
2. Were people even asked about it before implementing such a highly resourceful project?
3. Do they know how their rights may be affected by such a system based upon artificial intelligence and advanced analytics?
4. Had they known the capabilities of the system and its possible risks for the human rights?
5. Would they be willing to spend their tax money on such projects?

These questions were the basis to go to people and ask for their views and preferences and trade-off between privacy and surveillance in public spaces. The next chapter focuses on this aspect as to how to elicit public perceptions of subjects and beneficiaries of security measures to mitigate the security risks.

Chapter 6
Methodology: Revealing Public Preferences

6.1. Process Assesment

It was important to gauge preferences of public through a process which is credible and by learning from the past. In US and Europe, there have been various methods used to assess the public preferences. In 1990, Westin's General Privacy Concern Index classified the people in various categories based upon their level of concern for their Privacy (Kumaraguru & Cranor, 2005). Similarly, in 1994, another measure was Distrust Index which classified the level of Privacy level of trust of people as low, medium, high and very high when it came to activities of private sector or the government (Harris & Westin, 1996). British Social Attitudes Omnibus survey asked simple questions about level of freedoms given away by the people in order to prevent them from terrorism threats (Neil Robinson *et al.*, 2010). Majority of respondents (79%) were willing to allow Police to detain a person for three weeks without having any charge if he was suspected to be involved in a terrorism related case (Johnson & Gearty, 2007). Similarly, even greater majority was in favour of tapping phones of suspects and opening their mails without their information if people were suspected of involved in terrorist cases. The survey results indicated that 81% respondents were in favor of tapping phones and checking email of individuals suspected to be involved in terrorism (Johnson *et al.*, 2007).

Another opinion survey was conducted by Home Department of UK in 2005 to ascertain public demand for provision of Identity cards and to ascertain their demand and willingness to pay for passport and/or Identity Card. People were willing to pay GBP 93 for combined Passport and National Identity card or GBP 50 for identity card only (Steinbock, 2004). These examples show how people respond to simple questions about trade-off between Privacy and security and it is difficult to ascertain their reasons or

causes through simple opinion polls. There are few issues which these opinion polls have. First, these polls offer simplistic questions which are not realistic.

These surveys are also conducted closer to an event which may happen or just after some events have taken place. This currency and probability of happening of the events also create unrealistic scenario hence responses lack the authenticity or there is some level of influence over the preferences due to media coverage or due to memory of the events. *Secondly*, the framing of the questions or expectation that a portrayed scenario may happen to others only also changes the responses. In this case people are ready to give up on their liberties easily. *Thirdly*, they are not able to quantify their preferences to give up their liberties or privacy. The surveys give an idea about how many people think in particular manner but quantification of their preferences remains unresolved. *Lastly*, due to this very reason it is difficult to translate these preferences into cost benefit analysis. Similarly, it is not useful to estimate willing to pay for having a security infrastructure and being ready to give up on privacy rights.

6.2. Use of Discrete Choice Stated Preference Methods (DCSPM)

Some researchers have tried to address these issues by combining various aspects like presenting different scenarios and mixing them with Westin's Privacy Index (Joinson *et al.*, 2006). The scenarios can be painted on the basis of realistic choices in a given environment to generate data which help to generate evidence based public policy debate free from biases and close to reality in today's world.

6.3. Background

DCSPM is used to understand how people make the choices when they are provided with alternatives. The discrete choice model is developed by

providing a number of alternatives and then each alternative has a utility equation. This equation describes various levels of each attribute related to alternatives and decision makers makes choices on the basis of these attributes and various levels therein. A coefficient is estimated during modelling process which acts as a multiplier with each option to determine the impact of each choice one makes (Ben-Akiva & Lerman, 1985; Joinson *et al.*, 2006). The underlying assumption of this model is rational choice of the decision maker who uses an option with maximum utility for him.

There may be factors which cannot be observed by analysists in each utility equation, therefore, an error term is also taken as a correction factor for individual choices. Random utility theory framework is used to acknowledge that analysist do not have perfect information about utility functions as determined by the respondents themselves.

Logit analysis is used as a popular estimation procedure to assume that error terms on utilities are distributed identically and independently of each other. Model coefficients are produced through this estimation procedure and well represented through standard statistical criterion of maximum likelihood. Values of the coefficients and statistical significance of the coefficients is determined through this model estimation. There is also possibility of testing the utility functions through additional non-linear variations. Various functional forms help in determining if any group of people makes specific value on any attribute in the choices they have or systematic choice of a group of respondents for a particular alternative can be tested (Neil Robinson *et al.*, 2010).

In this research, discrete choice stated preference methods (DCSPM) is used to examine what are public preferences when they deal with competing and sometime diametrically opposite concepts and choices like surveillance and privacy. Stated preference techniques are aimed to examine how people trade-off among different levels of attributes

presenting price, quality improvement in goods and services when they face different choice tasks. Analysis of the choices made can help to establish willingness to pay for different benefits (or willingness to accept payment in exchange for bearing a particular loss. This method provides nuanced understanding of people's choices about non-market public goods like privacy and security through surveillance. Such approach has been used in other sectors like environment, value of time in transportation and in health services, so it can be used in this scenario (Bateman *et al.*, 2002).

In normal circumstances, governments make top down approach to identify real choices on the basis of risk assessments available to them against known vulnerabilities and threats to decide about investment of resources. The DCSPM is bottom up and based upon people's preferences. The method is also useful to determine cost-benefit decision making process regarding application of some security measures because it also helps to determine empirically any threshold which people might like to place while favoring a specific security measure or deployment.

This method is used keeping in mind that DCSPM have merits to be used to collect data to ascertain trade-offs people make while considering privacy and security through surveillance as a non-market public good. In addition, when people choose to relinquish one right of Privacy and support surveillance what is their motivation. It is also important to discover if monetization of the impact of choices like surveillance over privacy is possible. Assuming robustness of this method, it is important to know how much are people willing to pay to install any infrastructure and if there is any limit of their willingness to pay and why.

For this research, a survey tool was developed which is attached as (**Annexure -XVIII to XX).** The tool was designed to capture preferences of the respondents. Every respondent was presented with alternative options. The options described various dimensions of surveillance relating to

information on CCTV surveillance; on the type of security cameras; on output of the checks and number of time people are being watched; and on the additional costs of security measures and systems. To capture diversity among respondents, the survey presented questions to a sizeable sample of population of two cities of the Punjab, Multan and Rawalpindi, to capture their preferences, and also creating a range of scenarios in order to capture a detailed account of citizens'preferences. Total sample size for each city was 500 respondents which is duly supported by the literature for such type of studies (Taherdoost, 2017).

For quantitative analysis through DCSPM, structured questionnaire was developed to measure stated choices of respondents. The survey was administered face to face with the help of a private survey company. Further, for this research another focus was to understand implementation process and policies issued by the Punjab Safe Cities Authority (PSCA). A policy, for this research, is defined as set of actionable instructions or guidelines issued by the PSCA on a related issue which help in making organisational and individual decision. Time frame of this research was starting from 2016 to 2019. In first eighteen months, the implementation process was recorded in details. In following twelve months, data was collected to gauge the perception about the project and public preferences.

6.4. Choices for Privacy and Surveillance

In order to learn about people's preferences through various measures affecting their privacy and security, this research focusses on one real time scenario. Police in Pakistan uses CCTV cameras at mass scale for multiple purposes in the cities of Islamabad, Lahore and Kasur primarily. However, these are not used in many other cities as a comprehensive plan or in an organised manner in other cities. CCTV cameras are used in major cities of the world and their utility is established but in country like Pakistan it is still a new phenomenon. There can be many possible questions and choices

which people may have depending upon attributes of this intervention. The proposed intervention may be in conflict with privacy rights of the people in a number of ways. The proposed intervention for security of people may have a number of factors or attributes affecting their privacy to be considered by the people. These attributes with their levels may include the following:

6.4.1. Proposed number of Cameras in the City

Both the cities where this research is carried out, did not have any sensors for mass surveillance for security of the people. Although there is no yardstick for determining the number of cameras on the basis of population or area or length of roads or a combination of all above, but it was considered to assess the expected coverage of the city by cameras in each case.

The number of cameras will be required to cover the major public roads, entry exit points, road crossings and areas and where people visit for daily routine.

i. No Cameras
ii. 0-2000 Cameras
iii. 2001 - 4000 Cameras
iv. 4000 or more Cameras

6.4.2. Types of Cameras installed in the city

Although there is no history of cameras in these cities but mostly people understand the purpose of these cameras. This typology of cameras have different levels of ingress and intrusion into private and public spaces. Facial recognition cameras are used for detection of humans on the basis of their facial features which need to be compared with a database of wanted persons. Similarly, automated number plate readable cameras are used to

recognise the vehicles' number plates and recognise the wanted vehicles or track the desired vehicles through their number plates. Both types of cameras are advanced sensors of mass surveillance and affect the privacy of persons in multiple ways. Choice of people in selection of each type of camera or a combination of both also throws light upon preferences of the people about degree of intrusion into their privacy or increased level of security through these sensors.

It will be important to determine what the function of each camera is and this will inform about selection of the cameras**.** If you want to track and detect people and vehicles, then you need sophisticated cameras.

i. Standard CCTV Cameras
ii. Vehicle Number Plate Recognition Cameras
iii. Facial Recognition Cameras
iv. Vehicle Number Plate Recognition and Facial Recognition Cameras

6.4.3. Probability of Preventive action taken against suspicious activity BEFORE any incident/potential crime by Police with the help of CCTV cameras

It is commonly known the effective use of cameras in post incident scenarios. In such cases, Police have the reasons to use the recorded data. Another case of use of cameras which may have implication for privacy of people if there is a reasonable information to act and put up surveillance infrastructure for a specific case i.e. for any planned event or an undercover operation. In the presence of an infrastructure of mass surveillance placed for security purposes, it is reasonable for the people to expect that there will be some proactive action also taken by Police to prevent any wrong doing to happen. There may be expectations of the people to take proactive actions before any crime or in anticipation of any accident etc. It is

tantamount to allow or encourage the surveillance operators to be more or less proactive in their job, however, it will have an impact on privacy of the people. With the help of more observations, number of preventive actions can be taken or otherwise.

By monitoring through cameras, Police may be able to detect violations of laws and suspicious activities or illegal acts of the people/vehicle e.g. drug users or over speeding or illegal number plates on vehicles etc.

i. 0 - 25 preventive actions or observation/day
ii. 26-50 preventive actions or observation/day
iii. 51-75 preventive actions or observation/day
iv. More than 75 preventive actions or observation/day

6.4.4. Percentage of crimes/cases resolved AFTER the crime/incidents by Police with the help of CCTV cameras every month

At times, people are concerned about a situation or hazard including crime or traffic congestion or about any environmental condition like Air Quality Index in a particular place. In such a situation, any intervention by the decision makers comes with a promise to address the concerns partially or completely. CCTV cameras are a very useful tool for post crime evidence collection to be used for prosecution. This attribute like previous one, is also a performance indicator and measure of utility of the intervention for security.

After an incident or crime, footage of CCTV cameras may be used to detect the reasons and provide evidence to the court for resolving the case.

i. 0 - 5% per month
ii. 6 - 10% per month
iii. 11 - 15% per month

iv. More than 15% per month

6.4.5. Public will be exposed to all surveillance as people may be observed through CCTV cameras daily

CCTV cameras are useful for prevention of crime as well as the data obtained through CCTV is also used as an evidence for prosecution in court of law or for other civil purposes for insurance companies. But, this also means that people will also be exposed to cameras more than once in a day. Frequency of exposure depends upon number of cameras and also presence of the people in a particular area. Most of pro-privacy people will be concerned for this exposure and it will have an impact on their trade-off choices while thinking about choosing number this intervention.

Privacy of individuals may be reduced in public spaces due to CCTV cameras as a common person shall also be observed through these cameras every day and Public information is important for presence of surveillance programme for deterrence and creating a sense of security and caution for the people.

i. 0 - 10 times a day
ii. 11- 15 times a day
iii. 16 - 20 times a day
iv. More than 20 times a day

6.4.6. Annual reduction in crime by surveillance through CCTV cameras

This is one major output of the installation of CCTV cameras in big cities. This attribute is not only important for socio-economic perspective but it also has a political importance. Improvement in public safety is linked with crime rates in any society and if an intervention has a specific output like reduction in crime which is on public agenda, then there is more support for such

action. The effect of cameras is not only for evidence collection but it also acts as a deterrent for checking crime. This result is also useful for businesses and investment which is drawn towards low crime areas because of freedom of movement of people and goods. The programme may help in reduction of crime taking place in public sphere or otherwise and public perception may change that security situation has improved in the city through use of such a programme.

i. 05 - 10%
ii. 11 - 15%
iii. 16 - 20%
iv. More than 20%

6.4.7. Annual *Security Fee* from residents of the city may be charged for programme

This attribute is to measure respondents' willing to pay for CCTV program in the city. This is monetization of the trade-off people are ready to do for security and compromising their privacy in the context of cities in Pakistan. Besides, this attribute informs the authorities if they proceed with the program they may also have a source of funding available for sustainability of the program which is a major concern for public authorities. This focus on demand side of security intervention also brings home not only satisfaction about approval of the intervention but also a participatory approach before taking any policy decision by the authorities. The amount of this fee as determined in various levels also gives an idea about limits, if any, of this willingness to pay. In order to ensure public participation and for maintenance of the programme, annual security fee shall be charged from the residents who will be permanent beneficiaries of crime reduction and improvement in the public safety in their city.

i. No Fee from residents

ii. 500 - 1000 Rupee/Year
iii. 1001 - 2000 Rupee/Year
iv. More than 2001 Rupee/Year

6.5. Devising Choice Contexts

Each of the above attributes are required to have multiple choices. This is done to have realistic choices available to the respondents and they can understand how the above attributes can affect their privacy while making policy interventions like installation of surveillance systems like Lahore or Islamabad.

DCSPM was used in Rawalpindi and Multan because there were no CCTV cameras installed by the Police and there were no revealed preferences of the people about utility of such security measure. In addition, DCSPM enables policy makers to determine how much people are willing to pay while trading off between privacy and surveillance as a security measure.

6.6. Identifying Attributes and Levels

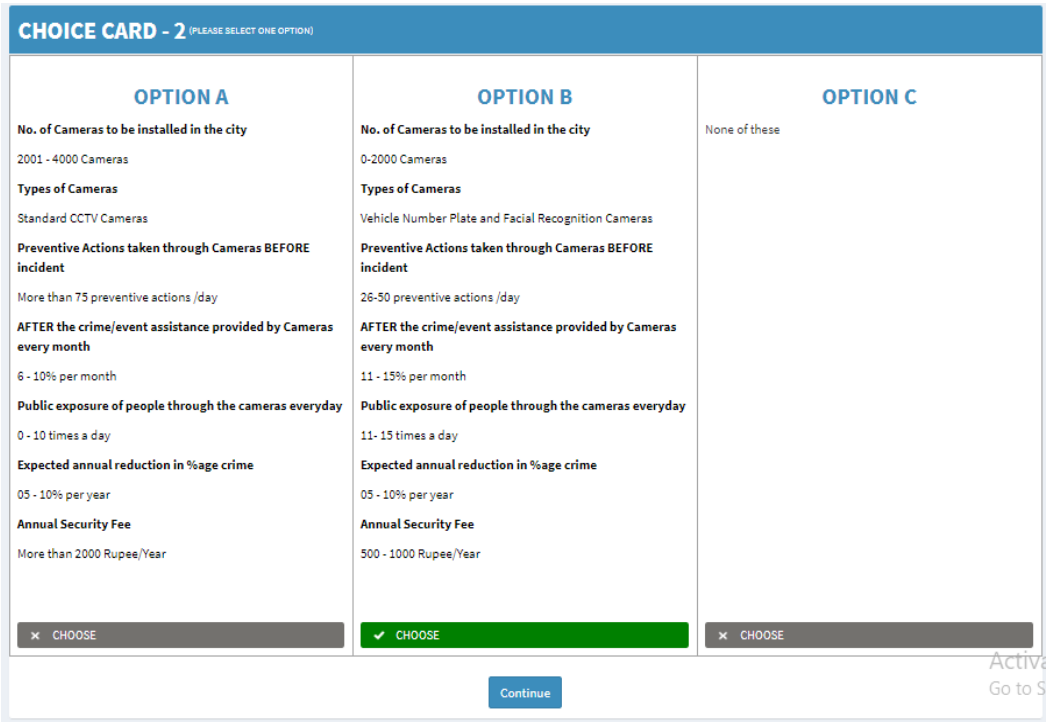
Attributes were identified through experience of establishing the PPIC3 Lahore and learning from opinion of security officials. After finalizing these attributes, it was required to attach a reference value to each of the attribute. The relative changes in realistic context of the reference values of each attribute are called levels (Levels assigned to each attribute of the survey were carefully selected to be realistic, precise and mutually exclusive). News reports in public domain and literature was consulted in order to derive reference values of these attributes. For example, open information available through various companies' websites, it was possible to learn about types of cameras to be installed for surveillance (Hikvision and Dahua Technology are one of the leading companies with CCTV surveillance products with different types of cameras including standard surveillance cameras, facial recognition cameras, vehicle number plate recognition and

facial and vehicle number plate recognition.). Public expectations before and after cameras installations were topic of the discussions in newspapers (Guardian, 2019; Khilji, 2019).

No.	Attributes	Levels
1	No. of Cameras to be installed in the city	i. No Cameras
		ii. 0-2000 Cameras
		iii. 2001 - 4000 Cameras
		iv. More than 4000 Cameras
2	Types of Cameras in the city	i. Standard CCTV Cameras
		ii. Vehicle Number Plate Recognition Cameras
		iii. Facial Recognition Cameras
		iv. Vehicle Number Plate and Facial Recognition Cameras
3	Preventive Actions taken through Cameras BEFORE incident	i. 0 - 25 preventive actions /day
		ii. 26-50 preventive actions /day
		iii. 51-75 preventive actions /day
		iv. More than 75 preventive actions /day
4	AFTER the crime/event assistance provided by Cameras every month	i. 0 - 5% per month
		ii. 6 - 10% per month
		iii. 11 - 15% per month

		iv. More than 15% per month
5	Public exposure of people through the cameras everyday	i. 0 - 10 times a day
		ii. 11- 15 times a day
		iii. 16 - 20 times a day
		iv. More than 20 times a day
6	Expected annual reduction in %age crime	i. 05 - 10% per year
		ii. 11 - 15% per year
		iii. 16 - 20% per year
		iv. More than 20% per year
7	Annual Security Fee	i. No Fee from residents
		ii. 500 - 1000 Rupee/Year
		iii. 1001 - 2000 Rupee/Year
		iv. More than 2000 Rupee/Year

In order to understand the socio-economic background of the respondents, though anonymously, details were also collected about age, gender, educational qualifications and profession of the respondents. At the end some cognitive questions were also included in the survey to ensure that respondents have proper understanding of the choices they have made.



6.7. Data Collection Process

The process of data collection was started with engagement of private company which deals with technology and has the capacity to conduct such analyses. The survey tool was elaborately described to the focal persons who trained the enumerators. The team combination of data enumerators was also ensured to have gender balance in Pakistani context. After comprehensive training, a pilot was run to iron out any difficulties.

Data collected through this survey has been managed through remote access also to save a digital copy of the same. A special software was designed by the company for this data collection and submission. The data is submitted to university data bank as per the requirements of this research

6.8. Anticipated Ethical Issues

There were no anticipated ethical issues regarding this study - in particular:

The data was anonymous since the beginning, as no personal information (names, Email address, telephone number etc.) was collected; only socio demographic information which they can opt out was collected.

The survey participants were the general public selected randomly.

To record responses of the survey, separate teams were formed for each of the two cities which featured participants from the respective city.

Each team member of the survey teams was provided with a latest android tablet for accurate and efficient data recording. Each team member was assigned a unique profile with dedicated login details to access and record responses of the survey.

A master profile with login credentials to access all individual accounts, was also created to continuously monitor the performance of each team member and compliance of the data being recorded with the standard instructions.

Each team member was provided with a data sheet to be filled in with the credentials of respondents to the survey including location (longitude/latitude), description of area and date of recording the response.

All participants provided their informed consent in order to participate in the experiment

There was no conflict of Interest between respondents to the survey and the Urbane (Pvt.) Ltd. However, to address this potential ethical issue, it was made sure that the respondents of the survey were randomly selected and they were not related to the company or its employees who have conducted the survey.

There was a commercial contract between the author and the company to deliver the outputs of survey.

Selection criteria of the company was based upon their areas of expertise, their capacity to complete the work as per standards and requirements of this research.

Urbane (Pvt.) Limited, a smart Cities Solutions Company, has been selected to make sure that they have the relevant experience of conducting such public surveys as well as they have right resources of technical nature as well as market research.

6.9. Risks for Data Collection

There was no reputational risk for the University because the surveying company was reputable enterprise and aware of the potential reputational risks. They were not going to survey vulnerable groups and subject has no sensitivities for the potential target audience.

Similarly, there was no security risk because the survey topic, area, settings were clear and survey company was local and have taken care of the hazards and well aware with security situation on daily basis. The general environment was also safe and without any security risks.

6.10. Conducting Surveys

There were three main steps for this survey:

a. Invitation for the Survey participation **(Annexure - XVIII)**
b. Informed Consent of the participants **(Annexure - XIX)**
c. Completion of questionnaire **(Annexure - XX)**

The respondents, randomly selected from the open public spaces/streets/shopping centres/offices etc, were invited to participate in this research at their will. This invitation was verbal and also through an informed consent form **(Annexure - XVIII).** It was an overt survey in which data collectors asked face to face question and explained the purpose and

intent of the data collection with voluntary contribution of the willing participants of target audience through one-page survey by experienced surveyors.

If they were willing to participate voluntarily without any return or reward, they were given a consent form showing the details as provided in the attached letter in **(Annexure - XIX)**.

After this they could complete a short questionnaire regarding an academic research project on surveillance arrangements in a city and their socio demographic status. The questionnaire to collect the data for this research is also in **(Annexure - XX)**.

Actual time of each survey was 10-15 minutes, as people were asked few questions with a preamble about the purposes, privacy, anonymity and legitimacy of the survey during the process.

The company conducting the survey used an electronic device/tablet to collect data and directly enrolled in electronic form to save time and cost of data entry as well as to protect data. Two different teams were used at two cities to avoid any biases as well as for integrity of data. For precaution paper based applications were also filled to avoid any data entry and to go back to record for confirmation.

6.10.1. Survey Population

Population of Rawalpindi is 5,405,633 (male:2,741,872 female: 2,663,075 and transgender: 686) whereas population of Multan is 4,745,109(male: 2,437,412 female: 2,307,504 and transgender: 193) (PWD, 2017). The participant of the survey were randomly chosen from this population from various segments of society with various academic and economic backgrounds as defined in the survey tool.

In order to get a representative sample of population of each city, it is required to havesmall survey booth/halting points, with the permission of owners/administration of the location, in public areas to attract the willing participants. As there were no specific organisations or institutions target of this survey, places were randomly selected in each city where probability was high of finding people belonging to certain age group, economic back ground and social status.

6.10.2. Recruitment Strategy

The participants were selected randomly from the public places in the cities. For inviting people for participation, they were requested through a receptionist, to read or hear about the purpose of survey and they were asked questions before they give a consent for participation. The communication skills of the surveyors are harnessed during the training provided by the company and any auxiliary questions they might had about the survey tool. Underlying assumption holds good that people voluntarily contribute in sharing their opinion if it is not about a sensitive subject or where there are no risks of reputation or other concerns. However, this needs to be communicated and they choose to participate or not after looking into the questionnaire or talking to the person conducting this exercise.

Once, these introductory steps were completed, which took 10 to 15 minutes, rest of the survey may involve more than 10 - 15 minutes. The introduction was given to a group of people, in some cases, and then same time was not required for all participants. The whole exercise and process took more time than individual form completion duration. It was a major undertaking and involves costs and time to collect the primary data.

Each city has population of more than 4 million. A sample size of 500 (rational is given (CRS, 1982) and, 4.5% margin of error was used to select the sample size.) was suggested for this survey which was appropriate for

this research. All this process was duly approved by the Ethics Committee of Business and Law.

6.10.3. Confidentiality of Participants

Participants only from general public were surveyed. No personal information (names, email address etc. was collected but only socio-economic and demographic information (gender, income etc.) wasrequired. The data is completely anonymous.

The consent form was collected separately and there was no way it could link the consent forms to the survey questionnaires. Paper records were scanned and preserved till retention of original data. Paper records shall be destroyed after completion of project and award of degree. Till that time, it will be kept in encrypted form and papers shall be kept in a proper lock up with no unauthorized access.

On field, the enumerators collected data on electronic devices i.e android based tablets from each respondent face to face. For anonymity, name or number was used to link any identity of the respondent. However, the data was transmitted on daily basis to the company hub in Lahore. In addition to eliminate any possibility of wrong entry, enumerators were required to add their GPS location for each response collected. Timing of these questionnaire and location made it possible to ascertain geographical spread and inclusivity of all segments of society in a city area. The detail of major areas/locations where survey was conducted is provided below. Detailed summary of survey responses along with different.detailed account of mass surveillance system is being discussed in thenext chapter and there is descriptive analysis of primary data collected through this methodology.

6.11. Pilot Phase of Survey

6.11.1. Methodology

A pilot phase was conducted before commencement of the survey with the purpose to test the survey questionnaire using a smaller sample compared to the planned sample size. As part of the pilot phase, each survey facilitator recorded 10 responses for Survey-1 “Public Preferences on Tradeoff between Privacy and Surveillance in Public Spaces” and 30 corresponding responses for Survey-2 “Choice Cards”. The detailed methodology applied for conducting the pilot phase of the survey is described below.

6.11.2. Team Configuration

The pilot phase of the survey was conducted by the same two teams which conducted the actual survey in Rawalpindi and Multan. Each team consisted of 5 members with 3 male and 2 female members to ensure gender inclusivity. Each member of the survey team was a well-educated individual with a very good command over English, Urdu and local languages of the two cities i.e. Punjabi, *Potohari* and *Saraiki*.

6.11.3. Equipment Details

The pilot phase of the survey was conducted using latest android tablets and web-based application which was provided with the survey questionnaire for both Survye-1 and Survey-2. Every member of the survey team was provided with a latest android tablet for accurate and efficient data recording. Every member of the survey team was assigned a unique profile with dedicated login details to access and record responses to the pilot phase of the survey. Every member of the survey team recorded 10 unique responses against all 21 questions in survey-1 and against 30 corresponding choice cards from survey-2. The responses coming from all

team members were monitored by the Survey Trainer via a master profile with login credentials to access all individual accounts.

6.11.4. Timeline

The pilot phase of survey was done separately by each survey team upon completion of their training session. The training session was divided into four sections including i) introduction and purpose of the survey ii) explanation of each question contained in survey-1 and survey-2 iii) guidelines to perform the survey and iv) test run of survey-1 and survey-2 on prescribed equipment. The survey team applied similar methodology in the pilot phase that was applied in the actual survey.

6.11.5. Response Collection

As part of the pilot phase, every member of the survey teams recorded 10 unique responses to Survey-1 and corresponding 30 responses to Survey-2. A total of 50 unique responses against Survey-1 and 150 unique responses against corresponding choice cards in Survey-2 were recorded by each survey team.

6.11.6. Improvements

The pilot phase was instrumental in highlighting potential problems with the methodology of survey response collection, survey equipment and web-based application for recording responses. Some of the key issues highlighted in the pilot phase and improvements made thereof are as following:

1)The major problem highlighted by both survey teams for Rawalpindi and Multan were that the survey participants were finding it hard to interpret the survey questionnaire due to its and terms such as vehicle number plate recognition cameras and facial recognition cameras. This issue was tackled

by the survey teams by explaining to the survey participants about types of surveillance cameras and their functionality.

2) Another problem that was highlighted by the survey teams was that the participants were generally not very aware of the concept of privacy and its tradeoff with the surveillance. The issue was tackled by the survey team by explaining to the survey participants about their privacy and role of surveillance technologies in it.

3) Another issue that was highlighted during the pilot phase was to ensure that dispersion of the survey responses within the geographic location of Rawalpindi and Multan. This issue was tackled by providing every member of the survey team with a dedicated geographic location within their respective city. Every member of the survey team was provided with a data sheet to be filled in with the credentials of respondents to the survey including location (longitude/latitude) description of area and date of recording the response.

4) The survey team also reported issues regarding the malfunctioning of two android tablets and the same were replaced with new ones.

5) The survey team also reported issues regarding slow response time of web-based application while recording survey responses. The issues were tackled by the technical support team.

6) The time tracker for recording response to each survey was also added in the web-based application after the pilot phase.

The pilot phase allowed survey facilitator to become familiar with the procedures and the protocols to be implemented while conducting the survey in self-administrated environment. All potential problem areas and deficiencies in the research instruments and protocol prior to recording survey responses were successfully tackled as a result of the pilot phase.

6.12. Survey Response Collection Report by Rawalpindi Team

The survey team consisted of 5 members, 3 males and 2 females. The survey covered all major areas in Rawalpindi, both residential and commercial. The respondents were chosen randomly i.e. teams conducting surveys in the residential areas, parks and housing communities, informed people about the survey and after getting their consent recorded their responses. Similarly, teams that went to the designated commercial areas focused on engaging shopkeepers as well as the customers. The survey facilitators only helped the respondents in understanding the survey questions and did not influence their decision in anyway.

The surveys in Rawalpindi were conducted in the following areas:

Team 1 Conducted Survey in:

- Askari 14 (Res/Comm)
- Morgah (Res/Comm)
- Adyala Road (Res/Comm)
- Askari 13(Res/Comm)
- Askari 7(Res/Comm)
- Khadim Hussain Road

Team 2 Conducted Survey in:

- Sabzazar Road
- Lal kurti (Res/Comm)
- Saddar
- Askari 11(Res/Comm)
- Qasim Market
- Misrial Road

Team 3 Conducted Survey in:

- Askari 1
- Askari 2
- Askari 3 (res/comm)
- Scheme 3 (res/comm)
- Askari 4
- Askari 10 (res/comm)
- Chaklala Garisson
- Rawal Road (res/comm)
- Gracey Line (res/comm)
- Satellite Town (res/comm)
- 6th Road (res/comm)

Team 4 Conducted Survey in:

- DHA Ph 3
- DHA Ph 2 (Res/Comm)
- DHA 1 (Res/Comm)
- Bahria Town Ph 1-6 (Res/Comm)
- Bahria Town Ph 7-8 (Res/Comm)
- DHA 1 Orchard Area (Res/Comm)
- Gulraiz (Res/Comm)

6.13. Survey Response Collection Report by Multan Team

The survey team consisted of 5 members, 3 males and 2 females. The survey covered all major areas in Multan, both residential and commercial. The respondents were chosen randomly i.e. teams conducting surveys in the residential areas went to parks and housing communities, informed people about the survey and after getting consent recorded their responses. Similarly, teams that went to the designated commercial areas focused on engaging shopkeepers as well as the customers. The survey facilitators

only helped the respondents in understanding the survey questions and did not influence their decision in anyway.

The surveys in Multan were conducted in the following areas:

Member 1 Conducted Survey in:

- Mumtazabad (Res/Comm)
- Shah Rukh-e-Alam Colony (Res/Comm)
- KIA Motors, Suzuki Motors
- Gulgusht Colony (Res/Comm)
- Vehari Road
- Punjab College, City College, Jinnah High School.
- WAPDA Colony

Member 2 Conducted Survey in:

- Bahadur Pur (Res/Comm)
- Mehmood Kot (Res/Comm)
- Bosan Road
- BZU Road (Res/Comm)
- Institute of Southern Punjab, University of Central Punjab
- Shalimar Colony (Res/Comm)
- Nasheman Colony (Res/Comm)
- Nawab Pur Road

Member 3 Conducted Survey in:

- Al-Qureish Colony (Res/Comm)
- Garden Town (Res/Comm)
- Multan Cantt
- Gardezi Colony (Res/Comm)
- Aziz Hotel Chowk

- SP Chowk
- Dera Adda
- Abdali Road
- Railway Road

Member 4 Conducted Survey in:

- Jaleel Abad Colony (Res/Comm)
- Nawa Shehar (Res/Comm)
- Hassan Parwana (Res/Comm)
- Double Phatak
- Mujtaba Colony (Res/Comm)
- United Mall, Chen One Tower

Member 5 Conducted Survey in:

- Khuni Burj (Res/Comm)
- Pak Gate (Res/Comm)
- Haram Gate (Res/Comm)
- Dolat Gate (Res/Comm)
- Masoom's Café
- Gloria Jeans
- Ghanta Ghar

On field, the enumerators collected data on electronic devices i.e android based tablets from each respondent face to face. For anonymity, name or number was used to link any identity of the respondent. However, the data was transmitted on daily basis to the company hub in Lahore. In addition to eliminate any possibility of wrong entry, enumerators were required to add their GPS location for each response collected. Timing of these questionnaire and location made it possible to ascertain geographical spread and inclusivity of all segments of society in a city area. Detailed

summary of survey responses along with differentdetailed account of mass surveillance system is being discussed in the next chapter and there is descriptive analysis of primary data collected through this methodology.

Chapter 7

Descriptive analysis - Rawalpindi and Multan

This chapter presents descriptive analysis of demographics features including gender, age, qualification, employment and income status of respondents of survey from Rawalpindi and Multan

In terms of gender, out of 500 respondents of Rawalpindi, 270 were males and 224 were females whereas 6 participants preferred not to reveal their gender.

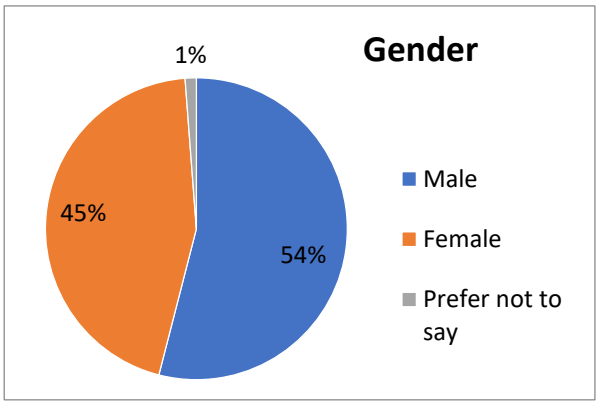


Chart 3. Gender (Rwp)

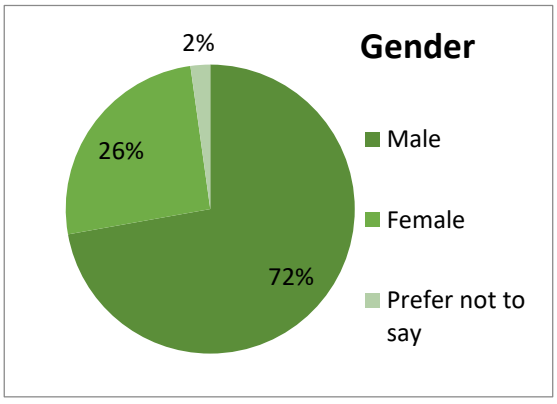


Chart 4. Gender (Mlt)

In Multan, out of 500 participants of Multan, 361 were males and 128 females. 11 participants preferred not to reveal their gender.

In terms of age groups, out of 500 participants of Rawalpindi, 134 were aged 16-25, 226 aged between 26-40, 111 aged between 41-55 and 29 were aged 56 or above

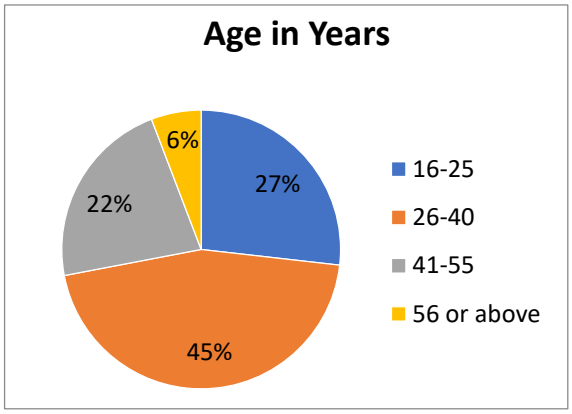
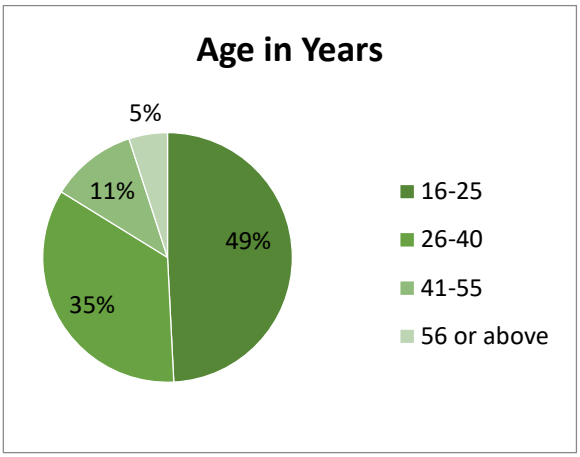


Chart 5. Age in Years (Rwp)



In Multan, out of 500 participants of Multan, 246 were aged between 16-25, 173 aged between 26-40, 56 aged between 41-55 and 25 aged 56 or above

Chart 6.. Age in Years (Mlt)

In terms of academic qualification of respondents of Rawalpindi, out of 500 participants, 343 had graduate degree or above, 103 had FA/FSc or A levels education, 47 had above matriculation qualification and only 7 had up to O levels education.

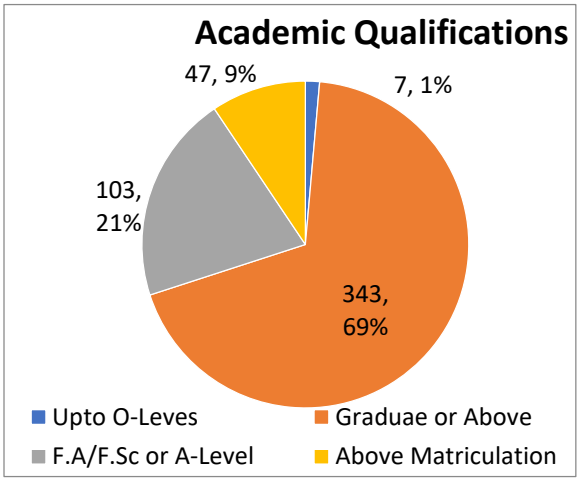
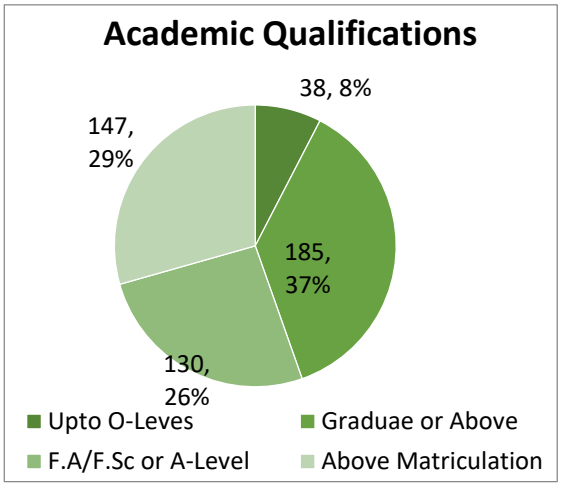


Chart 7.. Academic Qualification (Rwp)



Whereas in terms of academic qualification of respondents of Multan, out of 500 participants, 185 had a graduate or above, 130 participants had FA/FSc or A-Levels education, 147 participants had above matriculation and 38 participants had academic qualification up to O-Levels.

Chart 8. Academic Qualification (Mlt)

In terms of employment status, out of 500 participants of Rawalpindi, 244 were employed and 67 unemployed. 147 were studying whereas 42 were running their own business.

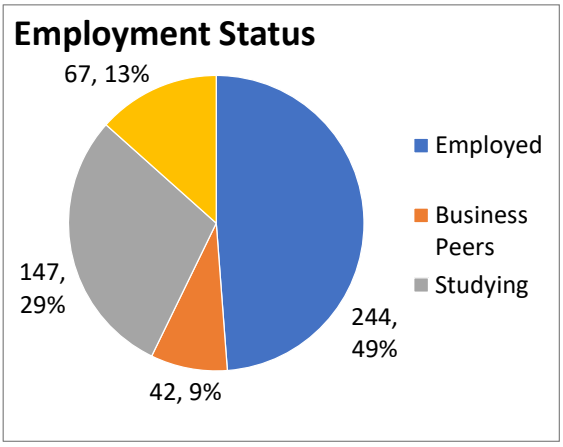
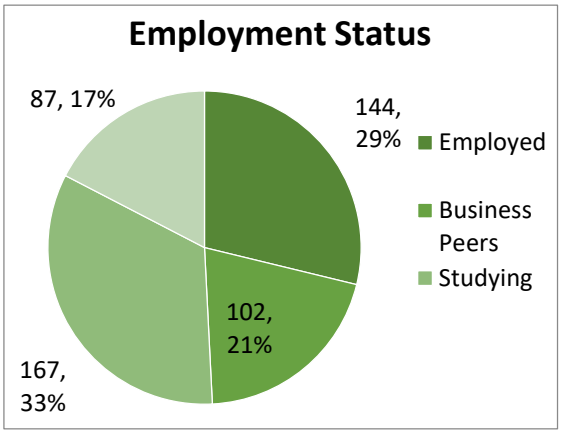


Chart 9. Employment Status (Rwp)



In Multan, out of 500 participants, 144 were employed and 87 unemployed. 167 participants were studying whereas 102 participants were running their own business.

Chart 10. Employment Status (Mlt)

In terms of approximately monthly incomes in Rawalpindi, out of 500 participants, 177 were earning between 0-15000, 124 were earning between 15001-45000, 114 were earning 45001-80000, 84 were earning above 80001.

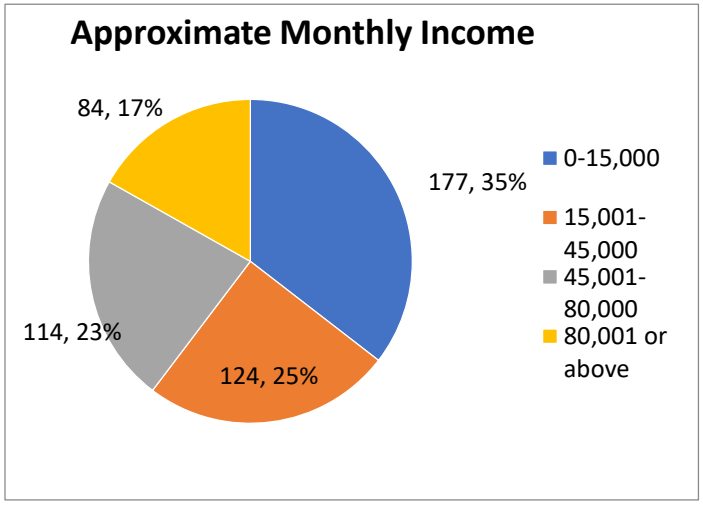
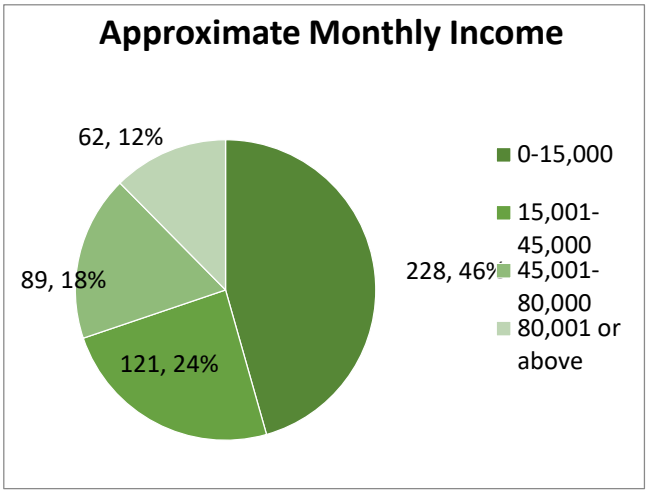


Chart 11. Approximate Monthly Income (Rwp)



In Multan, out of 500 participants, 228 were earning between 0-15000, 121 were earning between 15001-40000, 89 were earning between 45001-80000 and 62 participants were 80001 or above.

Chart 12. Approximate Monthly Income (Mlt)

In order to get a representative sample of population of each city, it required to have small survey boothe/halting points, with the permission of owners/administration of the location, in public areas to attract the wiling participants. The interesting thing to notice with demographics features of Multan is that majority of respondents were male, also majority of respondents belong to young age group and their qualification was less than graduate degree. As there were no specific organisations or institutions target of this survey, places were randomly selected in each city where probability was high of finding people belonging to certain age group, economic back ground and social status.

The section below presents respondents' choices about various attributes in the cities of Rawalpindi and Multan.

7.1. Proposed number of Cameras in the City

In response to the first attribute about installation of the number of cameras in Rawalpindi, more males (9.1%) were opposed to having any types of cameras as compared to females (3.9%). However, an overwhelming majority of males (77.4%) and females (78.4%) in Rawalpindi were in favor of having at least 2000 cameras in the city of Rawalpindi.

In response to the same attribute of proposed number of cameras in Multan, more males (4.8%) residents were opposed to having any type of cameras as compared to females (1.7%). Males (26.5%) and females (29.1%) were in favor of having at least 2000 cameras in the city of Multan. However, majority of males males (45.6%) as compared to females (21.4%) in Multan were of the view that there should be more than 2001 to 4000 cameras installed. Respectively, 23.1% males were of the view that there should be more than 4000 cameras. While a large number of females (47.9%) were in favor of 4000 and above cameras.

In terms of age groups, middle age group 41-55 years in Rawalpindi desired to have more than 4000 cameras (48.6%) as compared to younger age groups of 26-40 years (41.9%) or even 18-25 years (32.6%). Majority of the people in the age group of 56 years or above desire to have more than 2000 cameras.

Interestingly in Multan an overwhelming majority of people in all age groups (94% or above) is in favor of this intervention. More people (42.6%) in the age group of 26-40 years prefer to have 2000- 4000 cameras as compared to younger age groups of 18-25 years (36.1%) but most people (50.9%) in age group of 41-55 year of age desire to install 2002-4000 cameras. Majority of the people in the age group of 56 years or above desire to have more than 4000 cameras. This shows that there is an interesting correlation about increasing age and number of cameras preference for surveillance.

The respondents in Rawalpindi having an education level up to Grade 10 are in favor of cameras in number 2000 or above. Respondents with the education upto O-levels, also desired to have more than 4000 cameras in the city of Rawalpindi. Other than the people with education of A-level, others responded in favor of more than 4000 cameras.

Also, in Multan, 41.8% of respondents having qualification of upto Matriculation are in favor of cameras in number 4000 or more. 29% of respondents with qualification upto O-levels, also desired to have more than 4000 cameras in the city of Multan. Other than the people with academic qualification of Matriculation, major groups with higher qualification are in favor of 200-4000 cameras.

There are similarities in choices of employed and unemployed respondents in Rawalpindi regarding number of cameras. Majority of both groups are in favor of more than 2000 cameras and single largest section of both groups i.e. 44.6% have preferred to have more than 4000 cameras. In case of students, the largest group (38.5%) desires to have 2000-4000 cameras. Business persons have preferred to have more cameras in general. Opinion is divided equally as 42.9% respondents are in favor of 2000-4000 cameras and similar percentage of respondents are in favor of more than 4000 cameras.

In terms of employment status, both groups of employed and unemployed person in Multan are in favor of more than 2000 cameras and even a section of both groups i.e. 22.5% have preferred to have more than 4000 cameras. In case of students, the largest group (37.6%) desires to have more than 4000 cameras. Business persons have preferred to have more cameras in general. 58.1% respondents are in favor of 2000-4000 cameras and 28% of respondents are in favor of more than 4000 cameras

It is interesting to note that among the employed persons in Rawalpindi, majority (66.4%) of low income group (PKRs.15000 - 40,000) desire to have number of cameras from 2001 - 4000 or above. It shows that majority of all income generating groups' desire to have additional cameras. 50% of respondents with income of PKRs. 90,000 or above desire to have more than 4000 of cameras.

It is interesting to note that among the employed persons of low income group (PKRs.15000 - 40,000) desire to have number of cameras varies equally in all ranges. No clear preference is there. It shows that majority of all income generating groups' desire to have more than 2000 -4000 cameras or above. 53.6% of respondents with income of PKRs. 90,000 or above desire to have more than 4000 of cameras

7.2. Types of Cameras installed in the city

When the residents of Rawalpindi were asked about types of cameras, their response was mixed. A quarter of the male respondents were content with standard CCTV cameras as compared to 20.5% of females. Individuals seem to know more about Facial Recognition cameras which are further desired than ANPR cameras. Fairly a large number of males (47.4%) and females (54.5%) were inclined to have both intelligent functionalities of cameras i.e. ANPR and Facial Recognition. Their preference for ANPR cameras is however, less than facial recognition cameras.

When the population of Multan was asked about types of cameras, their response was also mixed. Only a minority of males and females is in favor of standard CCTV cameras. An overwhelming majority of males (66.9%) and females (70.4%) were inclined to have both intelligent functionalities of cameras i.e. ANPR and Facial Recognition. The trend of males and females' preference for ANPR cameras is however, less than facial recognition cameras when considered independent of each other.

A fairly large number of people in all age groups in Rawalpindi were in favor of getting intelligent features with cameras including facial recognition and vehicle number plate recognition cameras. When it comes to either of the two types of cameras or intelligent features, preference for automated vehicle number plate readable and recognition cameras is however, lesser than facial recognition cameras in all age groups.

The response was somehow similar in all age groups of Multan as they were in favor of getting intelligent features with cameras including facial recognition and vehicle number plate recognition cameras. When it comes to either of the two types of cameras or intelligent features, preference for automated vehicle number plate readable and recognition cameras is however, lesser than facial recognition cameras in all age groups.

It is a common feature that almost 20% people in Rawalpindi in all categories of education status are contend with Standard CCTV cameras. When the respondents were asked about the types of cameras to be installed in the city higher preference was granted to both types of cameras with intelligent features with facial recognition and vehicle number plate recognition system. Different results are received from respondents with the education qualification of upto O-level. People whose academic qualification is up to 0- level do not make much difference in the choices about standard CCTV cameras or vehicle number plate recognition cameras. Their least desire is for facial recognition cameras but if choice is combined with a vehicle number plate readable cameras than 37.5% of them were satisfied with both features.

Also, there is overwhelming choice for cameras with both intelligent features and capabilities regardless of their academic qualification as more than 60% respondents have preferred both types of cameras. Only respondents with academic qualification of A-level prefer automated cameras more than

Facial Recognition cameras but all other prefer facial cognition features cameras more and this choice is more than standard CCTV Cameras also.

Except for business persons, majority of other groups of respondents in Rawalpindi are in favor of installation of cameras with facial recognition and automated vehicle number plate recognition capacity. 29.4% Business persons are content with standard cameras. 23.3% student respondents are also supportive of standard cameras. A comparison of all choices shows that respondents desire either intelligent cameras with higher capabilities or standard CCTV cameras. There is least preference in all groups for only vehicle number plate recognitions cameras.

Similarly, majority of all groups of respondents in Multan regardless of their employment status are favoring installation of cameras with facial recognition and automated vehicle number plate recognition capacity. A comparison of all choices shows that respondents desire either intelligent cameras with higher capabilities or standard CCTV cameras but the preferences of business persons are 79.3% which is much higher than other groups.

Also, there is also a uniform trend in all income level groups in Rawalpindi that majority of all groups desire to have intelligent functionalities in cameras which include facial recognition as well as automated number plate recognitions functionalities. 58.3% of the highest income group respondents are the single largest group in favor of this advanced surveillance system.

Furthermore, there is also a uniform trend in all income level groups in Multan where majority of all groups desire to have intelligent functionalities in cameras which include facial recognition as well as automated number plate recognitions functionalities. 85.3% of the highest income group respondents are the single largest group in favor of this advanced surveillance system.

7.3. Probability of Preventive action taken against suspicious activity BEFORE any incident/potential crime by Police with the help of CCTV cameras

A preventive action for the purpose of this research is defined as any abnormal activity noticed by the Police officers working through the CCTV cameras. It may include noticing any illegal activity or act which may cause any crime, unlawful obstacle or suspicious activity in view of the cameras. It is interesting to note that the respondents of Rawalpindi did not overly desire preventive action taken with the help of information received through cameras. In this case, females (70.4%) desired at least 50 preventive action taken per day for preventive activity and number of males (71.8%) is also in favor of similar number of preventive actions per day. Though, all respondents were not in favor of higher levels of preventive actions taken by the Police through cameras.

In Multan, it is interesting to note that the male respondents did not overly desire preventive action taken with the help of information received through cameras. Largest group of male desire 26-50 preventive actions per day. In this case, females (66.9%) desired more than 51 preventive action taken per day for preventive activity as compared to number of males (45.5%) who are also in favor of similar number of preventive actions per day.

The respondents in all age groups in Rawalpindi have expectation that Police officers who are behind the cameras should be able to take 26-50 preventive actions per day in general. However, more people between the age group of 41-55 years (56%) expect this than respondents of other age groups which are 46.2% (56 years or above) to 50.4% (18-25 years).

Also, 30% of the respondents in age group of 18-25 years in Multan City have expectation that Police officers who are behind the cameras should be able to take 26-50 preventive actions per day in general. 51% of the

above age group think it should be more than 51 preventive actions per day. In all groups this is common but more people between the age group of 41-55 years (67%) expect more than 51 preventive action by Police than respondents of other age groups which are 57.1% in age group of 56 years or above and 51% in age group of 18-25 years.

Also, data shows respondents in Rawalpindi up to matriculation education did not really care about the number of preventing action taking activities before any incident or potential crime by the police with the help of CCTV cameras. It is the people with high academic qualification who are more inclined towards taking 26 - 50 actions per day by Police before any incident of potential crime or suspicious activity. 50% or more respondents with academic qualification off 12 years or higher desire that probability of preventive action before any activity should be more than 26 - 50 reactions per day by the Police with the help of CCTV cameras

The respondents in all academic qualification groups in Multan have mixed choices about the number of preventing action taking activities before any incident or potential crime by the police with the help of CCTV cameras. There are no clear preferences for a specific limit of preventive actions taken or observed by the Police officers through CCTV cameras. In general, 80% or more Respondents in all academic qualification groups prefer that probability of preventive action before any activity should be more than 26 - 50 reactions per day by the Police with the help of CCTV cameras.

Moreover, expectations of unemployed, employed, students and business persons in Rawalpindi are uniform and in modest range. Majority in all groups is satisfied if probability of preventive action taken by Police against suspicious action before any incident or potential crime is from 26-50 actions per day. Second trend for more observation (51-75 observations/day) across all groups.

Moreover, expectations of unemployed, employed, students and business persons in Multan are uniform and in modest range. Majority in all groups is satisfied if probability of preventive action taken by Police against suspicious action before any incident or potential crime is from 26-50 actions per day. Second trend for more observation (51-75 observations/day) across all groups.

Similarly, a uniform trend is visible in respondents of all income groups in Rawalpindi expect that there is a higher probability of taking 26-50 preventive actions taken per day. This preference prevails almost in majority of all income groups.

Finally, a uniform trend is visible among respondents of all income groups in Multan expect that there is a higher probability of taking 26-50 preventive actions taken per day. This preference prevails almost in majority of all income groups

7.4. Percentage of crimes/cases resolved AFTER the crime/incidents by Police with the help of CCTV cameras every month

When asked about expectations of the respondents of Rawalpindi about resolution of crimes or cases after the incidents have taken place, trend is similar in males (41.6%) and females (43.7%) that at least 10% -15% of the crimes and cases should be resolved every month with the help of CCTV cameras. Respondents with higher expectations are much less in number both genders.

The response by the residents of Multan, when asked about expectations about resolution of crimes or cases after the incidents have taken place, was a mixed one from males and females. However, females (47%) desire that more than 15% of the crimes and cases should be resolved every month with the help of CCTV cameras. People who did not want to disclose

their gender desire that more than 11% or more crimes should be resolved through CCTV Cameras every month.

Also, the age group of 41-56 years' in Rawalpindi desire more than other age groups that post incident crimes/cases resolution should be possible through CCTV cameras but their expectation is mostly upto 11-15% of cases per month. There are a limited number of people in each age group who are in favor of more than 15% solved cases per month through post incident analysis by police with the help of cameras. This expectation is more in younger people in age group of 18-25 years (20.2%) than any other group.

Respondents (84.6%) in the age group of 41-56 years' desire more than other age groups that post incident crimes/cases resolution should be possible through CCTV cameras but their expectation is mostly upto 11-15% of cases per month. There are a large number of people in each age group who are in favor of more than 15% solved cases per month through post incident analysis by police with the help of cameras. This expectation is more in people in age group of 41-55 years (42.3%) and even higher (47.6%) in age group of 56 years and above.

Moreover, preferences of the respondents in Rawalpindi regardless of their academic qualification is clear in this case about resolution of percentages of crime and cases is all post incident scenario with the help of CCTV camera every month. The respondent with academic qualification higher than 12 years of education expect that 11 to 15% of the cases should be resolved with the help of cameras every month by Police. There is trust on the capability of the cameras in their use in post incident scenario every month.

Respondents (61.2%) upto matriculation qualification expect that more than 15% of the cases should be resolved with the help of cameras every month

by Police. There is trust on the capability of the cameras in their use in post incident scenario every month as more than 88% respondents have this expectation in resolution of cases through CCTV Cameras.

Furthermore, majority of business persons (54.5%) in Rawalpindi prefer that every month 11-15% crimes/cases are resolved by Police with the help of CCTV Cameras. Less (32.8%) Unemployed persons have this expectation where as 43.9% respondents who are studying and 43% employed respondents have similar expectation. This pattern is also uniform with little variation in unemployed group in which the largest group (34.4%) thinks that 6-10% of crime detection and resolution after incident is also acceptable.

Majority of business persons (40.2%) prefer that every month more than 15% crimes/cases are resolved by Police with the help of CCTV Cameras. 29.1% Unemployed persons have this expectation where as 31.3% respondents who are studying and 30.3% employed respondents have similar expectation.

Finally, in Rawalpindi no single large group exists to expect that post incident resolution of cases and crimes by the Police will be in certain limits. Larger groups in all the income groups deliberate that 11-15% cases must be resolved with the help of CCTV cameras. This is followed by a second largest group in each income group who expect that this probability can be between 6-10%. Combined effect of both groups educates that majority of all respondents regardless of their income level expect resolution of cases and in post crime resolution every month.

And no single large group exists to expect that post incident resolution of cases and crimes by the Police will be in certain limits. Larger groups in all the income groups deliberate that 06-10% cases must be resolved with the help of CCTV cameras. This is followed by a second largest group in each income group who expect that this probability can be between 11-15%.

Combined effect of both groups educates that majority of all respondents regardless of their income level expect resolution of cases and in post crime resolution every month. However, in income group of PKRs. 90,001 and above 52.7% respondents prefer to have more than 15% crime reduction per month with the help of CCTV cameras.

7.5. Public will be exposed to all surveillance as individuals may be observed through CCTV cameras daily

When it comes to daily exposure of people to these cameras, again there is a similarity in preferences of respondents of Rawalpindi regardless of their gender. Most preferred level of exposure is 11-15 times a day among males (47.6%) and females (47.1%). A very small percentage of respondents (males 7% & females 7.1%) is content with exposure of more than 20 times a day. This indicates that there is limited acceptability of more daily exposure to these cameras. This also indicates the sensitivity about security measures and privacy concerns of the respondents.

Among the respondents of Multan, a small percentage of respondents (males 17.9% & females 16.7%) is of opinion that exposure of public will be upto 10 times a day. Male responders are divided equally about public exposure in each category i.e. 11-15 times a day, 16-20 times a day and more than 20 times a day. 412% of female are of the opinion that public exposure will be more than 20 times a day.

Among different age groups of respondents of Rawalpindi, 56 years or above age group people think that exposure will be 0-10 times (34.8%) or 11-15 times (38.5%). Smallest minority in all respondents opines that exposure of public will be more than 20 times a day.

In terms of respondents of Multan from various age groups, 56 years or above age group people think that exposure will be 16-20 times (38.1%) or

more than 20 times a day (33.3%). This shows that respondents are aware about public exposure on daily basis to the CCTV cameras.

Majority of respondents of Rawalpindi regardless of their academic qualification, understand that public will be exposed to surveillance and observed daily 11 to 15 times a day through these CCTV cameras. At least 20% of respondents with an education level of Grade 12 and above have fair expectation that exposure of public to surveillance maybe from 16 to 20 times a day. There is no respondent of the academic qualification up to O-level who has chosen public exposure of 16 to 20 times a day through CCTV cameras.

In Multan, 57.5% of respondents with upto matriculation qualification expected that public exposure shall be more than 20 times a day or more to these CCTV cameras. Major groups upto academic qualification of A-Level expect public exposure upto 16-20 times per day. Respondents with academic qualification of graduation or above have divided opinion about probability of public exposure to the CCTV cameras.

Except business person respondents in Rawalpindi, a large number of all other groups are of the opinion that public will be exposed to surveillance through cameras for 11-15 times per day. In business person opinion is equally divided (33.3%). An equal size of respondents group thinks that this exposure of public will be from 16-20 times a day. Even a smaller group (12.1%) thinks that it can be even more than 20 times a day.

Similarly, in Multan, except business person respondents, a large number of all other groups are of the opinion that public will be exposed to surveillance through cameras for 16-20 times per day or higher. In all groups, opinion is divided and a clear pattern is not there. However, expectations are higher for exposure of public more than 11-15 time per day with CCTV cameras.

Majority of respondents of Rawalpindi in the range of low income (PKRs. 15000 -40000) per month and PKRs 40,001 - 60,000, expect that public exposure to the surveillance system will be 11-15 times per day. In other cases of exposure opinion is divided in these monthly income groups. However, respondents with higher monthly income is consistent in their opinion that exposure of public to the surveillance will be 11-15 time per day and more than that.

Majority of respondents of Multan in the range of low income PKRs. 15000 -40000 per month and PKRs 40,001 - 60,000, expect that public exposure to the surveillance system will be more than 16-20 times per day. In other cases of exposure opinion is divided in these monthly income groups. However, respondents with higher monthly income is consistent in their opinion that exposure of public to the surveillance will be 16-20 time per day and more than that.

7.6. Annual reduction in crime by surveillance through CCTV cameras

In Rawalpindi, respondents have high expectations about results of mass surveillance through cameras. Both male and female respondents want to see that there should be reduction in crime rates on an annual basis as a result of this intervention. 49.8% males desire at least 11-15% reduction and 22.9% males look forward to 16-20% reduction in crime annually. 15.9% males want reduction in crime beyond 20%. With small variations, females' expectations are of a similar nature.

Similar to Rawalpindi, both male and female respondents of Multan want to see that there should be reduction in crime rates on an annual basis as a result of this intervention. 56.5% female respondents have high expectations about results of mass surveillance through cameras which should be more than 20% annually. 59.6% males desire more than 15%

reduction in crime annually. 38.7% males prefer that annual reduction in crime should be more than 20%.

Also, in Rawalpindi preferences of people in the middle age groups differ from two extremes of very young people or the people above 56 years of age. Majority of people in age group of 26-40 years and 41-55 years are expecting that annual reduction in crime through surveillance in society may be upto 11-15%. However, people in age group of 18-25 years and above 56 years also desire further annual reduction in crime than 11-15% also. Their combine preferences of over 15% are higher than number of respondents who expect or are satisfied with upto 15% annual reduction in crime. The rationale behind this thinking process of each age group may vary between these two groups as well but trends are strikingly similar.

In Multan, large groups of people in all age group are expecting that annual reduction in crime through surveillance in society may be more than 20%. However, there are other groups who do not expect higher reduction in crime annually but overwhelming majority of respondents in all groups is expecting 16% or more reduction in crime annually as a consequence of this surveillance programme.

Moreover, even the less educated people also expect that there will be 11 to 15% reduction in annual crime because of installation of the cameras. 62.5% of the respondents with the academic qualification up to O-level think that annual reduction in crime may be 16-20% or higher. The respondents with higher qualification than bachelor's degree have more expectations, with 44.1% respondents expecting 11 to 15% of reduction of crime annually. 18.4% of the graduates or higher qualification respondents think that reduction in crime rate maybe more than 20% per year.

Respondents from Multan even with less education level of upto O-Level expect that there will be more than 20% reduction in annual crime because

of installation of the cameras. 69.4% of the respondents with the academic qualification up to O-level think that annual reduction in crime may 20% or higher. The respondents with higher qualification than bachelor's degree have more expectations, with 22 % respondents expecting 15 to 20% of reduction of crime annually. 36.1% of the graduates or higher qualification respondents think that reduction in crime rate maybe more than 20% per year.

There is an interesting trend among the respondents, regardless of their employment status, overwhelming majority is of the opinion that CCTV cameras will help in reduction of crime from at least 11-15% or more. This percentage is 84.4% in employed persons, 88.5% in unemployed persons, 86.4% in students and 91.2% in business persons' group.

Irrespective of employment status, larger groups in Multan, in each category, are of the opinion that CCTV cameras will help in reduction of crime more than 20% or more. This percentage is 41.8% in employed persons, 45.6% in unemployed persons, 39% in students and 50.5% in business person's group.

There is a similar trend among low income groups and higher monthly income groups in Rawalpindi. Majority of respondents in the range of low income (PKRs. 15000 -40000) per month and Rs 40,001 - 60,000, expect that reduction in crime due to the surveillance system will be 11-15 % annually. However, respondents with higher monthly income are consistent in their opinion that reduction in crimes due to the surveillance system through CCTV cameras will be 11-15 % annually or more than that.

A similar trend is observed among low income groups and higher monthly income groups in Multan. Majority of respondents in all income range expect that reduction in crime due to the surveillance system should be more than 11-15 % annually or more. However, respondents with higher

monthly income are consistent in their opinion that reduction in crimes due to the surveillance system through CCTV cameras will be more than 20% annually.

7.7. Annual Security Fee from residents of the city may be charged for the programme

When asked about willingness to pay a security fee for installation of cameras, 24.8% males and 27.5% females from Rawalpindi were not supportive of charging the residents of the city of Rawalpindi for this security intervention. Although 40% males and 39.6% females were willing to pay 500 -1000 Rupees per year for the surveillance cameras. 30.9% males and 26.1% females are also willing to pay from 1001- 2000 rupees annually for the program. This demonstrates that financing the program and/or sustaining the surveillance program is also possible through various means of financing, plus there are less differences in choices when it comes to gender.

In response to the question regarding willingness to pay annual security, 14.7% males and 7% female residents of Multan were not supportive of charging the residents of the city of Multan City for this security intervention. 56.5% Female Respondents are willing to pay more than PKRs. 2000 per year as a security fee. 59.6% males are willing to pay more than Rs 1001 as a security fee annually for this surveillance program. 38.7% males have chosen to pay even higher fee of more than PKRs. 2000 per annum.

When it comes to paying for the programme, it is observed that people in Rawalpindi in the age of 56 years or above are not willing to pay anything as compared to people of other age groups . There are an equal number of people 38.5% who are willing to pay up to PKRs.1000 annually for the surveillance program. The predominant choice among the people in the age of 18 to 25 years is from PKRs.500 to PKRs. 1,000 annually and same is

the case with people in the age group of 26 to 40 years. In all cases more than 60% of people are willing to pay a minimal security fee for this program in the range of PKRs.500 to 2000 Rs per year.

In Multan, in all age groups, more than 50% of people are not willing to pay a minimal security fee for this program. It is observed that 70% respondents in the age of 26-40 years are highest compared to the other age groups who are not willing to pay anything. An annual security fee of PKRs. 500 to PKRs.1,000 is the agreeable choice among the respondents who are willing to pay in all age groups.

In Rawalpindi, 50% of respondents with O-level education are not willing to pay any security fee for the program. The willingness to pay is higher and at high rates also in case of respondents of academic qualification of FA-FSc/A-level. 47.3% of FA-FSc/A-Level respondents are willing to pay upto PKRs. 500-1000 per year for this surveillance program. 30.5% of respondents with graduation or above academic qualification are also willing to pay from PKRs. 1000- 2000 security fee for this surveillance program. This clearly illustrates that if the program is designed based upon this source of financing then it would be a successful effort to impose a security fee for bearing cost of the program as well as to sustain it for operational purposes.

The data from Multan shows that 69.4% of respondents up to Matriculation are willing to pay any security fee more than PKRs.2001 per annum for the program. The willingness to pay is lesser at high rates in case of respondents of academic qualification of FA-FSc/A-level. 40% of FA-FSc/A-Level respondents are willing to pay more than PKRs. 2001 per year for this surveillance program. 36.1% of respondents with graduation or above academic qualification are also willing to pay from PKRs. 2001 security fee for this surveillance program.

In Rawalpindi, the business persons are least of all groups (20.6%) who think that there should be no Security fee charged from the residents for this programme. 24.9% employed, 26.2% unemployed and 27.8% students are unwilling to pay any security fee. Largest group on above three categories are willing to pay 500-1000 rupees annually. It is only the business persons (35.3%) who are willing to pay 1001-2000 rupees annually as security fee for establishing and maintaining this surveillance program.

When it comes to paying for the programme, in Multan in all groups, more than 50% of people are not willing to pay a minimal security fee for this program. It is observed that 70.9% unemployed respondents are highest compared to the other groups who are not willing to pay anything for surveillance program. Even 62% business persons are not willing to contribute for surveillance program. An annual security fee of PKRs. 500 to PKRs.1,000 is the agreeable choice among the respondents who are willing to pay in all employment related groups.

Understandably, 33% of lowest month income group in Rawalpindi do not prefer to pay any security fee for the surveillance system annually in Rawalpindi. There are however, 22.2% respondents in the highest monthly income group in this research, who are not willing to pay any kind of security fee. There is positive support for a proposed security fee of PKRs. 500-1000 per annum in all income groups. Nevertheless, a larger group (41.7%) among the highest monthly income slab is willing to pay security fee upto PKRs. 1001 - 2000 every year.

In Multan the data shows that 35.2% of respondents with income of PKRs. 15,000 - 40,000 are willing to pay any security fee more than PKRs.2001 per annum for the program. The willingness to pay is higher at high income groups. Majority of respondents (57.4%) with income of PKRs. 90,001 are willing to pay more than PKRs. 2001 per year for this surveillance program. There are few interesting outcomes of this data collected through

Rawalpindi and Multan. In some cases, there are similarities and in many other cases, differences are there. In next chapter, it will be useful to test choices presented to the respondents and applying Discrete Choice Method and derive some policy options.

A complete graphical layout of responses gathered from each of two cities against all above mentioned seven attributes with respect to each of five demographic features (gender, age, education, employment, income) is provided at **(Annexure - XXI)**.

This demonstrates that financing the program and/or sustaining the surveillance program is also possible through various means of financing, It also illustrates that if the program is designed based upon this source of financing then it would be a successful effort to impose a security fee for bearing cost of the program as well as to sustain it for operational purposes.

7.8. Test of Association

The Pearson χ^2 p value (estimated probability) in most of the cases (except monthly income groups) is higher than the alpha value 0.05 (the value for alpha used to conclude whether or not the null hypothesis is rejected) and therefore proportions of most of the socio-demographics are not significantly different in various categories of these groups tested in the Rawalpindi survey and surveillance survey.

An example:

Research question: Does the proportion of males and females different across the Number of cameras to be installed in the city groups/categories?

Null Hypothesis: Independent (proportions of males and females are independent of the Number of cameras to be installed in the city)

Alternative hypothesis: Dependent (proportions are dependent on the Number of cameras to be installed in the city)

If the estimated probability value (p value) is smaller than the alpha value (level of significance), we reject the null and say the difference in proportions of males and females across the Number of cameras to be installed in the city groups/categories i.e. our observation of difference among males and females, is statistically significant.

Rawalpindi

No	Attributes	Levels	Gender	Age	Qualifications	Employment Status	Monthly Income (Rs)
1	No. of Cameras to be installed in the city	i.No Cameras	Yes	Yes	Yes	Yes	Yes
		i.0-2000 Cameras					
		i.2001 - 4000 Cameras					
		v.More than 4000 Cameras					
2	Types of Cameras in the city	i.Standard CCTV Cameras	Yes	Yes	Yes	Yes	Yes
		i.Vehicle Number Plate Recognition Cameras					
		i.Facial Recognition Cameras					
		v.Vehicle Number Plate and Facial Recognition Cameras					
3	Preventive Actions taken through Cameras BEFORE incident	i.0 - 25 preventive actions /day	Yes	Yes	Yes	Yes	Yes
		i.26-50 preventive actions /day					
		i.51-75 preventive actions /day					
		v.More than 75 preventive actions /day					
4	AFTER the crime/event assistance provided by Cameras every month	i.0 - 5% per month	Yes	Yes	Yes	Yes	Yes
		i.6 - 10% per month					
		i.11 - 15% per month					
		v.More than 15% per month					
5	Public exposure of people through the	i.0 - 10 times a day	Yes	Yes	Yes	Yes	Yes
		i.11- 15 times a day					
		i.16 - 20 times a day					
		v.More than 20 times a day					

	cameras everyday						
6	Expected annual reduction in %age crime	i.05 - 10% per year i.11 - 15% per year i.16 - 20% per year v.More than 20% per year	Yes	Yes	Yes	Yes	Yes
7	Annual Security Fee	i.No Fee from residents i.500 - 1000 Rupee/Year i.1001 - 2000 Rupee/Year v.More than 2000 Rupee/Year	Yes	Yes	Yes	Yes	Yes

Multan

No.	Attributes	Levels	Gender	Age	Qualifications	Employment Status	Monthly Income (Rs)
1	No. of Cameras to be installed in the city	v.No Cameras	Yes	Yes	Yes	Yes	Yes
		i.0-2000 Cameras					
		i.2001 - 4000 Cameras					
		i.More than 4000 Cameras					
2	Types of Cameras in the city	v.Standard CCTV Cameras	Yes	Yes	Yes	Yes	Yes
		i.Vehicle Number Plate Recognition Cameras					
		i.Facial Recognition Cameras					
		i.Vehicle Number Plate and Facial Recognition Cameras					
3	Preventive Actions taken through Cameras BEFORE incident	v.0 - 25 preventive actions /day	Yes	Yes	Yes	Yes	Yes
		i.26-50 preventive actions /day					
		i.51-75 preventive actions /day					
		i.More than 75 preventive actions /day					
4	AFTER the crime/event assistance provided by Cameras every month	v.0 - 5% per month	Yes	Yes	Yes	Yes	Yes
		i.6 - 10% per month					
		i.11 - 15% per month					
		i.More than 15% per month					
5	Public exposure of	v.0 - 10 times a day	Yes	Yes	Yes	Yes	Yes
		i.11- 15 times a day					

	people through the cameras everyday	i.16 - 20 times a day i.More than 20 times a day					
6	Expected annual reduction in %age crime	v.05 - 10% per year i.11 - 15% per year i.16 - 20% per year i.More than 20% per year	Yes	Yes	Yes	Yes	Yes
7	Annual Security Fee	v.No Fee from residents i.500 - 1000 Rupee/Year i.1001 - 2000 Rupee/Year i.More than 2000 Rupee/Year	Yes	Yes	Yes	Yes	Yes

Chapter 8
Public Preferences for Privacy and Surveillance

In the light of descriptive analysis of the data collected, this chapter comprises of analysis of public preferences through stated preferences discrete choice model. As a result of this analysis, policy options are considered for both cities in light of people's choices.

The stated preferences discrete choice modelling (henceforth SPDCM) methodology elicits individual preferences for new and/or innovative products and services (systems) in the marketplace. SPDCM methodology relies upon three major conceptual pillars: random utility maximization (RUM) theory, comprehensively analyzed by McFadden (1974), Lancaster characteristics approach (LCA), covered by Papa theodorou (2001), Apostolakis (2003), and complex psychological decision-making theories. Randomness component in the proposed theory rises from the fact that the respondent has preferences for a particular product/service (e.g. surveillance system) that are observable to respondent but not necessarily to the researcher. This unexplained variation can be captured by suggesting a random element (εin) as a component part of the individual's (n) utility function (Uin) for alternative (i). All these arguments considered in this paragraph can be summarized under a behavioral process function of the form.

$$U_{in} = V_{in} + \varepsilon_{in}.$$
$$= (\beta X_{in}) + \varepsilon_{in}. \qquad (1)$$

The above equation states that an individual's utility function can be decomposed into a deterministic (observable) part Vin, β represents individual taste or preference coefficients, Xin stands for a vector of explanatory variables (attributes of product/service/system) and a random (unobservable, or stochastic) component εin, which varies across

individuals. Equation 1 allows consumers' tastes (betas) to vary in a homogeneous way across the population. Essentially, in the case of the homogeneous preference specification all betas in the equation are set to vary in the same way for every respondent (i.e., $\beta 1 = \beta 2 = \beta 3 = \ldots\ldots \beta N$).

In particular, beta coefficients in equation (1) represent individual taste and preference parameters for each product attribute and their levels or configurations. Thus, following LCA, the product (system) under investigation has been decomposed into six (6) product attributes, with each attribute defined over four (4) levels. One also has to bear in mind that each product attribute has one status quo level that is left out as the reference category or base, for the remaining levels of that attribute. Hence, for each one of the six (6) product attributes making up the product under investigation, there are three (3) beta coefficients (β) and one reference category, or base that is used for comparative purposes. The base category usually represents the current state of the world, or the current status of that particular product attribute. Therefore, the empirical findings will capture individual preferences and | or tastes for alternative configurations (either improvements, or deteriorations from the current state of the world) of the product's features. Considering the homogeneous nature of the model, initially these taste or preference parameters (betas) will not be allowed to vary across individuals. Nevertheless, more complex preference specifications exist that allow for preference or taste heterogeneity across respondents.

The research adopted the DCSPM as the methodological framework for the collection of the empirical data. Two choice modeling surveys were carried out in the two provincial cities (Rawalpindi and Multan) during the research period. The two surveys used the same attributes and their levels, although all choice cards were unique for each one of the 500 respondents in each city. Each survey (questionnaire) contained a unique choice experiment. Each choice experiment was comprised of three choice sets (cards).

Correspondingly, each one of the three choice sets contained two choice alternatives (comprised of random combination of policy attributes and their configurations), as well as a 'no-option' alternative. Thus, in total each respondent dealt with 3 choice sets, 6 (2*3) choice alternatives and 3 (1*3) 'no-option' alternatives. Figure 1 below presents a typical choice card used in this research. The block design routine in SAS was used to produce these unique pair-wise combinations. Each respondent was presented choice alternatives for each combination only once. This procedure introduced randomness in the design. In total, the survey collected 4500 unique observations (500 survey questionnaires * 3 choice cards * 3 options).

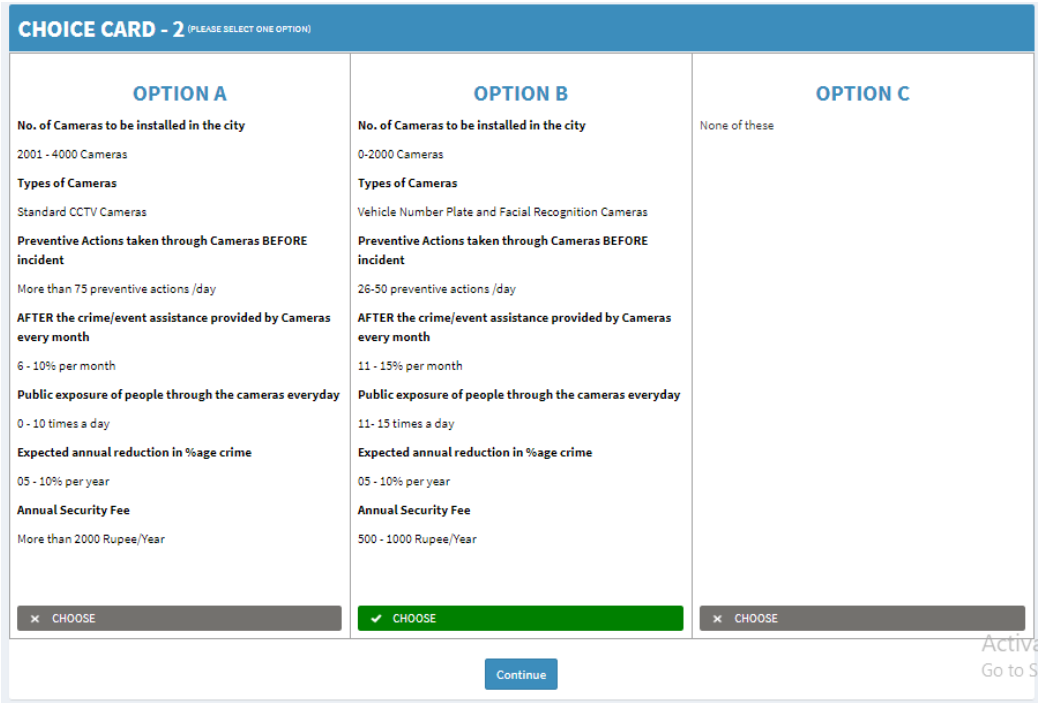


Figure 10. Choice Card

8.1. Empirical Results

8.1.1. Descriptive Results

The paper/report first considers the socio-demographic composition of the sample population from the two cities. Table 8 below summarizes this information for the two cities. The DCSPM experiment was carried out

independently (i.e., two separate but identical surveys) in the two cities in the province. Hence, each one had a population of 500 respondents. According to the information in Table 8 below, the majority of respondents in Rawalpindi and Multan respectively were 51.6% and 74.9% *males*, predominantly *young* (26 – 40 years of age) (45% in Rawalpindi) and even *younger* (18-25 years of age) (50.6% in Multan), *very well educated* (67%) and (41.8%), *in employment* (46% in Rawalpindi) or *studying* (37.5% in Multan), albeit at *relatively low income levels* (more than 57% and 60.8% respectively of respondents reported income levels below 65.000 rupees per year).

Table 8. Sample Characteristics (Cities of Rawalpindi and Multan)

	Rawalpindi		**Multan**	
		100.00		**100.00**
Gender				
Male	258	51.60	373	74.90
Female	236	47.20	117	23.49
Prefer not to say	6	1.20	8	1.61
Age in years?				
18–25	142	28.40	252	50.60
26–40	224	44.80	166	33.33
41–55	107	21.40	55	11.04
56 or above	27	5.40	25	5.02
Academic Qualifications?				
Up to Matriculation	54	10.80	134	26.91
Up to O-level	9	1.80	31	6.22
FA- FSc/A-Level	103	20.60	125	25.10
Graduate or above	334	66.80	208	41.77
Employment Status?				
Employed	214	46.02	129	26.01
Unemployed	67	14.41	88	17.74

Studying	148	31.83	186	37.50
Business Person	36	7.74	93	18.75
Approximate Monthly Income in Rupees				
15,000 -40,000	124	30.39	210	46.05
40,001 - 65,000	110	26.96	113	24.78
65,001 - 90,000	99	24.26	77	16.89
90,001 or above	75	18.38	56	12.28

8.1.2. Homogeneous Conditional Logit Model Specification

The stated preferences discrete choice modelling experiment (DCSPM) presented in this research generated a number of sets of interesting empirical findings. The analysis will elaborate on two sets of empirical findings. The chapter will present and comment on the results from the homogeneous Conditional logit model. It is worth reminding that in this section of the chapter, there is an implicit assumption that respondents tend to behave in the same fashion. Thus, we assume that their preference patterns are homogeneous.

This section of the chapter deals with respondents' individual preference patterns from the two Pakistani cities, Rawalpindi and Multan, respectively. Table 9 below summarizes the empirical findings from the two cities. As mentioned earlier on, there are seven (7) choice attributes, namely:

1. Number of cameras to be installed in the city
2. Types of cameras in the city
3. Preventive actions taken through Cameras BEFORE incident
4. Percentage of crimes/cases resolved AFTER the crime/incidents by Police with the help of CCTV cameras every month
5. Public exposure of people through the cameras everyday
6. Expected annual reduction in %age crime
7. Annual Security Fee

According to the results presented in Table 9, there are a number of similarities across the population of the two cities with respect to their preference patterns for security and surveillance. *First*, it appears that respondents in the two cities share the same opinions and preferences for the first policy initiative (the number of cameras to be installed in the city). Apparently, both Rawalpindi and Multan residents are favourably

disposed towards the installation of more surveillance cameras in their respective cities, as compared to the current situation (base level) where there are none.

The *second* common feature across the two cities relates to the seventh policy attribute (the annual security fee that residents would have to pay for the cost of maintaining the system). Based on the empirical findings, respondents in both cities were negatively disposed towards contributing to the maintenance of the system. In other words, respondents in either Rawalpindi or Multan were rather miffed in the idea of having to pay for maintaining the proposed system.

This finding could be interpreted twofold. On the one hand, finding that the 'price' attribute is negative and statistically significant for both cities, is a positive sign that respondents have understood the choice experiment and what was expected from them. Considering that both sets of respondents were presented with a hypothetical scenario (neither of the two cities has experience of a similar surveillance scheme), was always a concern regarding the validity of the SPDCM experiment, and whether or not respondents would be in a position to comprehend the nature of the exercise. On the other hand, the fact that the 'price' attribute is negative and statistically significant aligns with standard economic rationale, which again for internal validity reasons is a positive feature for the whole exercise.

Table 9. Homogeneous preference specification results

	Rawalpindi	Multan
No. of Cameras to be installed in the city		
No Cameras	Base	Base
0-2000 Cameras	1.697***	0.521***
	(13.15)	(4.94)
2001 - 4000 Cameras	1.985***	0.523***
	(15.12)	(4.88)
More than 4000 Cameras	1.607***	0.339***
	(12.28)	(3.18)
Types of Cameras in the city		
Standard CCTV Cameras	Base	Base
Vehicle Number Plate Recognition Cameras	-0.202*	0.0275
	(-1.80)	(0.26)
Facial Recognition Cameras	-0.365***	0.139
	(-3.20)	(1.32)
Vehicle Number Plate Recognition and Facial Recognition Cameras	0.243**	0.147
	(2.16)	(1.39)
Preventive Actions taken through Cameras BEFORE incident		
0 - 25 preventive actions/day	Base	Base
26-50 preventive actions/day	-0.00285	0.0753
	(-0.03)	(0.71)
51-75 preventive actions/day	0.0537	-0.184*
	(0.47)	(-1.74)
More than 75 preventive actions/day	0.0730	0.158
	(0.64)	(1.49)
AFTER the crime/event assistance provided by Cameras every month		
0 - 5% per month	Base	Base
6 - 10% per month	0.152	-0.0390
	(1.34)	(-0.37)

11 - 15% per month	0.0448	0.115
	(0.39)	(1.09)
More than 15% per month	0.186	0.102
	(1.61)	(0.95)
Public exposure of people through the cameras everyday		
0 - 10 times a day	Base	Base Base
11- 15 times a day	-0.0495	-0.159
	(-0.44)	(-1.51)
16 - 20 times a day	0.0842	-0.158
	(0.75)	(-1.50)
More than 20 times a day	0.0505	0.0797
	(0.44)	(0.75)
Expected annual reduction in %age crime		
05 - 10%	Base	Base Base
11 - 15%	-0.0912	0.0512
	(-0.80)	(0.48)
16 - 20%	-0.245**	-0.0501
	(-2.14)	(-0.47)
More than 20%	-0.00328	0.0472
	(-0.03)	(0.44)
Annual Security Fee		
Annual Security Fee	-0.195***	-0.132***
	(-5.40)	(-3.93)
N	3000	3000
r2		
r2_a		

** Significant at 1% level of significance, ** significant at 5% level of significance, *** significant at 10% level of significance.*

However, the above points were the only two cases where the results from the two cities aligned. So, the two abovementioned points aside, the empirical findings reveal some marked differences among respondents' preference structures. *Initially*, and as far as Rawalpindi is concerned, it appears that respondents seem to be a bit confused with respect to the type of cameras to be installed in their city (2nd policy attribute). For Rawalpindi residents, they are negatively disposed towards cameras that are able to recognise vehicles' number plates (2nd level) and cameras that are equipped with facial recognition abilities (3rd level), in relation to the status quo – current policy provision of standard CCTV cameras. On the contrary, they are positively disposed towards cameras that combine number plate and facial recognition technologies (4th level), as compared to the status quo.

A possible explanation for these results could be attributed to the fact that respondents felt that there is no point offering these policy initiatives separately when there are cameras that can achieve both tasks simultaneously, or with a single camera (what is the point of installing and maintaining two, when we can achieve the same results with only one of them). So, from an economic, practical but also aesthetic point it makes sense to have a system that achieves multiple objectives at the same time. Alternatively, one could argue that respondents believed that cameras catering for only one of the two (either vehicle or camera recognition) may not be enough or adequate in dealing with crime prevention and surveillance in their city. For comparative purposes, respondents in Multan did not express any (statistically) significant opinions as far as this policy initiative was concerned. The reader should also bear in mind the fact that the derived empirical results are always compared against the base. In the current context, the empirical results indicate that respondents express negative opinions regarding CCTV cameras with vehicle number plate reading and facial recognition capabilities, with

respect to the base category (having standard CCTV cameras). Thus, respondents in Rawalpindi practically argued that CCTV cameras with facial recognition or vehicle plate recognition capabilities does not really contribute that much to security, as compared to having standard CCTV cameras.

Moving on, respondents in Rawalpindi were positively disposed towards the 4th level (more than 15% of crimes/cases resolved AFTER the crime/incidents by police with the help of CCTV cameras every month), in relation to the status quo. None of the remaining policy configurations provided a statistically significant association. Similar to the point raised previously, one reason to explain this finding may be attributed to the fact that respondents were indeed keen to see as many crimes resolved as possible. Additionally, these responses may be taken as an indication of the difference that respondents are expecting the surveillance scheme to bring into their daily life. Again, for comparative purposes, residents in Multan did not express any significant opinions or preferences for this policy option on the whole.

Another issue that emerges from the examination of the empirical results from Rawalpindi is that respondents seemed to be negatively disposed towards the 16% to 20% reduction in crime as a result of the installation of the CCTV cameras. Although in first reading this is slightly difficult to comprehend, this finding may imply that respondents did not really believe that the system can be that efficient and successful in its results. Similar to the cases presented earlier, Multan residents did not have much to say about this attribute either. Multan residents on the other hand were also not particularly keen on the pre-emptive capabilities/nature of the proposed surveillance scheme. More specifically, the empirical results indicate that they expressed negative opinions on the possibility that the surveillance system provides enough evidence to police forces to take

actions on 51 – 75 preventive incidents per day, as compared to the status quo category (up to 25 preventive actions per day).

When considered together, the above mentioned two findings indicate that Rawalpindi residents exhibit strong and negative preferences towards the reactive capabilities of the surveillance scheme (in terms of the number or percentage of crimes being solved with the assistance of the system, whereas Multan residents exhibit the same strong and negative preferences for the proactive nature of the system (in terms of the number of crimes or cases being prevented) with the assistance of the surveillance scheme.

8.1.3. Marginal Willingness to Pay (MWTP) Estimates

Another interesting finding from the analysis of respondents' preference patterns, relates to the willingness – to – pay estimates that can be calculated for each policy attribute configuration. The interaction of the (7^{th}) 'price' attribute with each attribute configuration could provide respondents' marginal willingness to pay estimates for each policy configurations. Table 10 below summarises the empirical results regarding willingness to pay (WTP) estimates from the two cities.

Table 10. Willingness to Pay Estimates

	Rawalpindi	Multan
No. of Cameras to be installed in the city		
No Cameras	Base	Base
0-2000 Cameras	8.70	3.95
2001 - 4000 Cameras	10.18	3.96
More than 4000 Cameras	8.24	2.57
Types of Cameras in the city		
Standard CCTV Cameras	Base	Base

Vehicle Number Plate Recognition Cameras	-1.04	0.21	
Facial Recognition Cameras	-1.87	1.05	
Vehicle Number Plate Recognition and Facial Recognition Cameras	1.25	1.11	
Preventive Actions taken through Cameras BEFORE incident			
0 - 25 preventive actions/day	Base	Base	Base
26-50 preventive actions/day	-1.04	0.21	
51-75 preventive actions/day	-1.87	1.05	
More than 75 preventive actions/day	1.25	1.11	
AFTER the crime/event assistance provided by Cameras every month			
0 - 5% per month	Base	Base	Base
6 - 10% per month	0.78	-0.30	
11 - 15% per month	0.23	0.87	
More than 15% per month	0.95	0.77	
Public exposure of people through the cameras everyday			
0 - 10 times a day	Base	Base	Base
11- 15 times a day	-0.25	-1.20	
16 - 20 times a day	0.43	-1.20	
More than 20 times a day	0.26	0.60	
Expected annual reduction in %age crime			
05 - 10%	Base	Base	Base
11 - 15%	-0.47	0.39	
16 - 20%	-1.26	-0.38	
More than 20%	-0.02	0.36	

More specifically, the empirical results for the 1st policy attribute (number of cameras to be installed) indicate that Rawalpindi residents seem to be willing to pay a higher amount of money for surveillance purposes, as compared to Multan residents. In both cities, residents are willing to pay a higher amount of money for more cameras (8.76) and (3.97) rupees for up to 2000 cameras; (10.23) and (3.98) rupees for 2001 to 4000 cameras respectively for Rawalpindi and Multan). However, the willingness to pay amount of money goes down once the 4000 CCTV cameras landmark is exceeded (8.28 rupees and 2.59 rupees for Rawalpindi and Multan respectively). On the basis of these empirical results, one could argue that residents in both cities are willing to pay a higher amount of money for additional surveillance, but up to a certain point. Figure * below summarises the MWTP estimates for this product attribute.

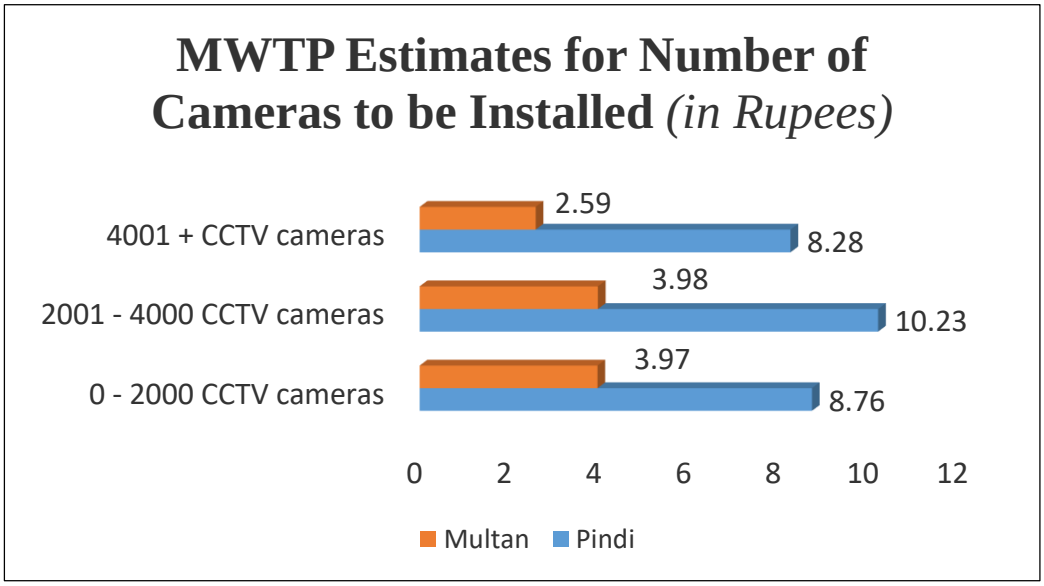


Chart 13. MWTP estimates for number of cameras to be installed (in Rupees)

As for the remaining statistically significant attribute configurations, **Chart 13** indicate that Rawalpindi residents would be willing to pay up to 1.25 rupees for the installation of CCTV cameras that deal with both vehicle number plate and facial recognition capabilities. Conversely, their

satisfaction levels would go down by 1.04 rupees and 1.87 rupees from the introduction of only number plate and facial recognition CCTV cameras respectively. Combined, the satisfaction they would receive from the introduction of vehicle number plate and facial recognition cameras seems to be lower, as compared to the dissatisfaction they would receive from pursuing each one policy initiative separately (2.91 rupees).

As for the remaining attributes, Rawalpindi residents would be willing to pay up to almost a rupee (0.94) for a reactive system that could resolve more than 15% of crimes/cases with the assistance of CCTV cameras every month), in relation to the status quo. They would also be 1.25 rupees worse off from a 16% to 20% reduction in crimes in their city. Finally, as far as Multan residents are concerned, the empirical results indicate that they would be 1.4 rupees worse off as a result of a pro-active system that allows police forces to take preventive actions for 51 to 75 instances on a daily basis. This last piece of information is rather interesting when considered in relation to the fact that Multan residents are also exhibiting lower WTP estimates for the number of cameras to be introduced (1st policy attribute), in relation to Rawalpindi residents. One could argue that collectively, Multan residents do not share the same enthusiasm for the potential of introducing a surveillance system in their city.

8.2. Policy Implications

The analysis of the empirical findings presented in the abovementioned section of the analysis give rise to a number of policy implications and set of ideas for policy makers and other stakeholders in the area. Hence, the interpretation of the empirical results in the previous section of the analysis would support the claim for evidence – based policy making in the area.

First, the empirical evidence from the DCSPM experiment indicated that residents in both cities would appreciate a security and surveillance system to be installed in their cities. They would be willing to support it financially. However, the interpretation of their responses also indicates that there is a limit as far as to how intrusive, or how extensive this system should be. Interpreting beta coefficients, as well as MWTP estimates from both cities for the 1st policy attribute indicates that respondents are appreciative of more CCTV cameras being installed, but there seems to be a limit up to how much the surveillance scheme should extend. The fact that they are still positive in the installation of more than 4000 cameras, but their willingness to pay is declining is an indication that their satisfaction and appreciation of the system is not insatiable. Individuals would welcome such a surveillance scheme, would be willing to support it financially, but there seems to be a tipping point as far as to how far the scheme could go. Going beyond the 4000 CCTV cameras mark would still be considered a positive thing (i.e., would contribute towards their security), but their willingness to pay would dwindle. Thus, policy makers would have to put some limits into the spread of the CCTV cameras and their numbers.

Second, and this relates mostly to Rawalpindi residents, it appears that installing CCTV cameras is not a policy panacea after all. Apparently, the evidence derived from the empirical results indicates that respondents would need to see a significant contribution to be made from the surveillance scheme and the technology being used, in order to support it. The evidence from the 2nd policy attribute (type of cameras to be installed) clearly showcases that the CCTV cameras to be installed would need to uphold certain technological standards in order to be accepted as a viable surveillance and security mechanism. In other words, the proposed surveillance scheme would have to make a substantial contribution to existing capabilities in order to be accepted in local

communities. Practically, this finding suggests that policy makers should search for technological solutions that address surveillance issues and security risks well into the future. The proposed surveillance system in order to be acceptable by the community would have to indicate its technological superiority and versatility over the years.

Combined, the evidence regarding the proactive and reactive capabilities of the surveillance scheme in both Rawalpindi and Multan is useful twofold. On the one hand, the combined evidence from the two policy initiatives (use of the system before and after the occurrence of a crime/incident) is rather interesting. What respondents' replies indicate is that they would like the system to operate as an evidence based or evidence collection mechanism as opposed to a punishment mechanism. In this respect, respondents indicated that they would like to use the surveillance system as a safety guard to protect them against any arbitrariness in their communities. According to the empirical results, individuals would prefer the system to operate in a consultative way, as opposed to a judge for potential criminal activity and deviant behaviour.

Hence, from a policy perspective, policy makers should focus on the depth (detailed information) of the system, as opposed to its stretch (coverage, or spread). Individuals seem to prefer a system that would provide police with adequate and good quality information to solve criminal activity and deviant behaviour, as opposed to extensive ability to watch and survey every aspect of residents' daily activity. Hence, the message is quality information, as opposed to quantity of information for crime solving and crime minimization.

On the other hand, the evidence from both the 3rd and the 4th policy attribute would tend to confirm that individual respondents place a significant value on the protection of their civil right and personal liberties including privacy. Contrary to the usual argument in similar cases, that the

implementation and use of such surveillance systems could infringe on personal liberties and rights, the evidence from the current setting suggest that individuals, even in crime ridden areas, value their civil right very highly. Thus, the setup, the use and operation of the proposed surveillance system should be structured in a way that residents do not feel threatened or inhibited by its use. Concurrently, this implies that policy makers should emphasise and promote the system's informative, as opposed to repressive capabilities. Upon the introduction of the said surveillance system, attention should be given by policy makers on how the system should work to serve them (for them), rather than check their deviant behaviour (work against them).

8.3. Way Forward

This research deals with issues of security through surveillance in two provincial cities (namely Multan and Rawalpindi) in the province of Punjab in Pakistan. The main research aim was to gauge individual preferences regarding trade-offs between privacy and surveillance as a result of a hypothetical policy initiative that involves the development of a surveillance scheme involving the installation of CCTV cameras in the cities under investigation. In order to facilitate evidence-based policy making in the area, the study elicited public preferences for policy making in the area, using a number of hypothetical scenarios. These scenarios have been designed using a number of policy attributes, each one with four different levels or configurations.

This research utilized a homogeneous logit model to elicit individual preferences regarding the establishment and operation of a hypothetical surveillance system in the two provincial cities. The underlying assumption of the homogeneous logit model specification is that all respondents behave in the same fashion and that there is no heterogeneity between agents and their preference structure. A choice

experiment, comprised of 500 unique choice experiments was distributed in each provincial city. Due to the experimental nature of the methodological approach, each choice alternative comprising the choice sets and the choice experiment represented a unique combination of policy attributes and configurations. Thus, each one choice alternative was only presented once in the whole choice experiment.

The empirical results revealed a number of interesting points for consideration.

First, respondents from both cities were keen to have more CCTV cameras in their cities. However, their interest was not insatiable. According to the empirical results they would be willing to pay up to 4000 cameras in their respective cities, but their willingness to pay diminishes (in both cities) after that limit. Implicitly, respondents are arguing that policy makers should pay close attention on managing and regulating the proposed surveillance scheme. Hence, the basic message coming from both cities is that they do appreciate the installation of CCTV cameras for privacy purposes, but they also expect this initiative not becoming an obstacle to their privacy.

Second, it appears that installing CCTV cameras is not a policy panacea, especially for Rawalpindi residents. They do value CCTV cameras, but only if they make a significant contribution towards their security levels, as compared to what is the case currently. Thus, they reject CCTV cameras that offer half – measures. Instead, they have made strong and positive advances for technologies that would be expectations to make their daily routine significantly safer. Again, this is a strong message for policy makers in the field, indicating that in order for the experiment to gain legitimacy and approval, residents would have to be convinced about the potential contribution to their lives.

Third, collectively the results from both cities indicate that respondents would prefer a system that does not restrict them from their daily activities and routine. They would rather prefer a surveillance system that provides evidence and supportive information to solve crimes and divergent behavior. Hence, they seem to prefer a surveillance scheme that can be used to provide hard evidence required to solve crimes. Again, this piece of information may signify to policy makers that they would need to design a system that provides information in depth (as opposed to geographical spread). This implies that policy makers should emphasize and promote the system's informative and evidential capabilities.

All in all, the last two points together could be taken to imply that for individual residents to accept and embrace the proposed surveillance system they would need to feel that they are not threatened by it, that it is there to make a difference to their lives, as opposed to punish them for something they did, and that it is going to make a significant contribution in terms of their security.

In above discussions and in previous chapters, it is clear that there is a positive inclination of people towards safe cities systems and provision of security through cameras. This research has also provided ample evidence that if asked, people may also be willing to pay for this extra expense for their security as privacy concerns are secondary in nature, even if they exist. These choices are in this point of time and may vary with the passage of time when people also face further issues of privacy protection as it happened in other parts of the world.

Chapter 9
Conclusion

It can be safely stated that concept of *Privacy* is prevalent in all societies. Video surveillance is a popular way to provide security and aim to reduce crime rates and a tool to disciple people's behavior (Koskela, 2000; Wang, 2013). PPIC3 Centre Lahore, commonly known as Lahore Safe City Project, is equipped with the latest digital technologies which are intrusive as well have the capacity to safeguard the city by extending full support to Lahore Police. The project is a significant addition in the security sector of Pakistan which has helped in restoring the image of Pakistan as a safe country. The journey of change management and adoption of a mass surveillance system in Lahore was demanding and cumbersome, however, the experience was not only a valuable addition in the security sector but from the change management perspective it also has very valuable lessons for the public sector authorities and private sector partners. Political ownership of change and stakeholders' management are key requirements in this context. Similarly, importance of strategic communication cannot be understated for such public centric projects in urban centres of under developed economies like Pakistan.

The decision of building PPIC3 Centre Lahore was taken because mass video surveillance systems are becoming popular for protection of life and property of citizens in major cities of the world (Nilsson, 2016; Obermaier & Hutle, 2016). The combined use of this surveillance with rapid response police teams have been very useful for prevention of crimes in Lahore. Integrated response teams like Dolphin Motorcycle Squad of Lahore allows for dedicated resources for emergency response. It is important to conduct a detailed cost benefit analysis of such concept of operations

because indirect benefits of the system are much more than mere replacement of surveillance method from human to digital placement of a tool. Precision, consistency, range of camera lens, night vision capability and video analytics obtained from the camera make it far more desirable equipment as a force multiplier. In addition, reduced risk to Police officers, all weather capability, saving the cost of movement and issues of human interactions in a society where police and public trust level is not ideal, it becomes a much more desirable arrangement to reduce the subjective application of law by a police officer on ground. Utility of data obtained through cameras becomes a very valuable product to work upon and use for law enforcement agencies and other actors of criminal justice system.

Punjab Police and PSCA regards it as a complex project not only from technological perspective but also as a harbinger of change in the policing culture in Pakistan which was a long-standing demand of public and political leadership alike. PSCA has provided independent opinion about positive results and impact of this project in the city of Lahore. However, this project was implemented as a top down approach by the political leadership by learning the lessons from other countries like UK and Turkey, to mention a few. There was no empirical evidence that public opinion was considered before taking this important decision to install 8000 cameras operated by Police in 2013.

This research was focused on filling this gap of eliciting public preferences which was missed in first instance for PPIC3 Centre Lahore. In a democratic society, public participation, in a suitable manner, is *sine qua non* for any policy intervention for a project of this scale. It becomes more important to elicit public perceptions when such an intervention of mass surveillance for enhancement of security has impact on other competing rights of the people.

This research was designed to seek opinion of people in two cities of Punjab, one in north and other in south of Punjab each with a population of more than five million people. First policy input of this research is acceptance for mass surveillance through cameras in Rawalpindi and Multan alike. This can be comforting information for the decision makers who presumed that mass surveillance for security enhancement is not only a technical solution imposed by experts but people of Lahore have also approved it as a desirable intervention for security, had they been consulted in the first place in 2013. Second finding is also a relief for the security experts that there is marginal willingness to pay by the people to bear the expenses of this intervention, in the form of a *Security Fee* if they are certain about the level of reduction in crime rates among other things. However, this marginal willingness to pay is not unlimited.

For policy makers in Punjab, it is possible to expect that people will support such interventions in other mega cities for such projects of change management in policing culture as well as in performance of police. Moreover, their tradeoff for privacy is also quantified and they can also develop these projects financed through the public for improvement in public safety and security of the people and for creating a safer environment for economic prosperity of cities. Albeit, there is need to take necessary steps to safeguard privacy rights of the people also.

Safe City Project of Lahore has deployed latest technology and some basic steps are being taken to forestall any legal issues around privacy rights for the first time in Pakistan. However, long-term steps have to be taken for the protection of privacy rights of the public. Though enhanced security comes at a cost of the privacy rights of the citizens in the absence of a comprehensive legal regime for protection of privacy rights of the people in Pakistan.

There are some laws already available in Pakistan which address the issues of use of digital surveillance (PECA, 2016). The Information for Fair Trial Act 2014 in Pakistan binds the law enforcement agencies and intelligence agencies that only a Judge can allow covert surveillance activities after elaborate procedures to be followed by the intelligence or Police authorities (IFTA, 2014). However, there are no standard procedures or technical requirements defined to install a certain type of camera at specific places in Pakistan. Anybody in Pakistan can install cameras at any place. In many cases, if they are conducting surveillance of public places through cameras, there is no authority to check, stop or regulate this activity. Recently the Metro Bus Authority of Punjab has installed cameras on the main roads of Lahore with the help of a private company for, reportedly, regulating the timing of their Buses but these cameras are also recording events in public places. It should be noted that Metro Bus Authority is not a law enforcing agency and further details about keeping record of this video surveillance and its further uses are not available for review and analysis.

The judicial systems in many countries are moving gradually with technological changes as compared to what are required in the twenty first century. Pakistan is one such example where a comprehensive model Safe City project is executed in Lahore but other partners of the Criminal Justice System i.e. prosecutors, courts and prisons are still following up. If some Police organisations are using it but the prosecutors and judiciary are not keeping pace with this development and laws are not revised to make best use of technological assistance available, then this asymmetrical development may create a positive pressure on institutions which are lagging behind in the technology transformation and e-governance.

There is no procedural federal or provincial law for protection of Privacy rights in Pakistan till date. Lack of this law causes some significant

consequences. For instance, Pakistan has signed and ratified ICCPR in 2010 but the process of adoption has not been completed due to the lack of a legal framework. Besides, and more importantly, the absence of a framework which constitutes basic principles, jeopardizing the enforcement of legal provisions on privacy, it may keep the people exposed in the absence of a comprehensive legal cover along with increasing surveillance by state and private actors in public places. This can be confirmed in evaluating the application of the legal provisions of Pakistan Penal Code, Civil Procedure Code and Criminal Procedure Code of 1898 and other legal instruments.

Opinion of respondents of Rawalpindi was also important in this aspect who make it more desirable that their priority and willingness to pay is conditional upon this very aspect. It is further supported by an international precedence in Europe. People are willing to tradeoff between their competing rights if they are certain about purpose of the interventions. The Venice Commission's while dilating upon Article 8 of the European Convention for the Protection of Human Rights and Fundamental Freedoms 1950 (ECHR) stressed upon the need of having elaborate laws for governance of CCTV cameras. Even in countries like Pakistan, use of CCTV cameras is becoming ubiquitous so a reminder of the commission is important. "*Video surveillance of public areas by public authorities or law enforcement agencies can constitute an undeniable threat to fundamental rights such as the right to privacy . . . and his/her right to benefit from specific protection regarding personal data collected by such surveillance . . . it is recommended that specific regulations should be enacted at both international and national level in order to cover the specific issue of video surveillance by public authorities of public areas as a limitation of the right to privacy*" (Commission, 2007).

It is quite obvious that there is a necessity of a legal framework regarding protection of privacy rights in Pakistan. It has become more obvious when

one thinks like usage of Safe Cities cameras. Under the Article 14 (1) of the Constitution, regulating CCTV usage in Pakistan, has become an essential requirement. As a consequence of this research, PSCA has evolved tertiary regulations limited to Punjab owned Safe cities cameras and surveillance system only. However, there is need to expand the scope of these regulations through a law framework in the province and bringing in regulation of private security cameras including cameras in shopping areas, cinemas, parks and other commercial places and data collected and used by these private surveillance systems.

Although PSCA has promulgated Data and Privacy Protection Procedures (DP3) yet with growing trend of installation of CCTV cameras in Pakistan strategic planning for security and protection of privacy rights in Pakistan is required sooner than later (DP3, 2020). First of all, privacy of individuals at private and public places should be acknowledged as a fundamental right by amendments in Article 14 (1) of the Constitution of Pakistan which is limited to privacy as right at home of the individuals (Constitution Pakistan, 1973). PSCA has already taken it up with the government of Pakistan, however, it needs to be implemented. Especially when it is not a new concept as many digitally advanced countries like Australia, USA and Germany have already done it. Moreover, it is also included in Universal Declaration of Human Rights since 1946 (UNDHR, 1946). Simultaneously, procedural law should be promulgated making it incumbent upon all CCTV or IPNV Cameras/systems operators, private or public, to ensure that this fundamental right should be respected in all respects. The procedural law will provide a framework of permissions and prohibitions about use of CCTV Cameras in public and private place, their inspection and monitoring regime and lastly corrective and punitive measures for violations of such an act.

Due to prevailing technological developments in the world, some authors call it “the end of the privacy” (Burt; & Geer;, 2017) or an era of “zero

privacy”(Lucky, 2008). In Pakistani context, the framework of fundamental human rights is already enshrined in the constitution of Pakistan which also includes privacy rights. Thus, protection of privacy rights in ever increasing sophisticated surveillance-based security environment is essential to maintain the human dignity and freedom. It is vital for preventing unlawful, unfettered and unlimited access to personal records, peoples’ preferences, their presence and movements in public places in the name of security(S. Khan, 2019). In the words of Benjamin Franklin, “Those who would give up essential Liberty, to purchase a little temporary Safety, deserve neither Liberty nor Safety” (Franklin, 1755).

Recommendations

1. Public preferences must be solicited before application of any public policy initiative which can have adverse effects on their fundamental human rights. There should be standard practices to enforce such measure with the consent of the people for democratic and participative governance in urban centres.

2. The people subjected to surveillance also change their behavior consciously and unconsciously as it impacts their civil rights i.e. right to assemble and right to express their opinion. Security concerns of public should be balanced while safeguarding the privacy rights of the people.

3. In a country like Pakistan where the literacy rate is high in the urban areas, vigorous public awareness campaigns need to be commissioned prior to launching of such projects. And a result of these campaigns, recommendations and suggestions of public should be considering while designing surveillance of schemes.

4. Implementation of complex IT based projects in public sector must be cautiously designed. As it requires continuous communication with numerous stakeholders and needs strong technical, organizational and political ownership.

5. For lawful and legitimate purposes of mass surveillance, system must be designed with matching capacities to operate under ethical and lawful codes of practice to protect individual rights to privacy and adhere to the principles of Data Protection.

6. In Pakistani context, it is desirable to make a constitutional amendment in the Article 14 (1) as part of the international obligations of ICCPR and International Convention on the rights of

Children to expand the scope of the concept of privacy from home to public places as well.

7. Presently there is no legal framework or regulatory mechanism to check the mushrooming growth of such electronic surveillance gadgets operated by private individuals and entities in Pakistan. There is any regulatory framework to prevent risks caused through abuse of such systems. PSCA can play a vital role as a regulatory body to monitor use of private sector cameras for lawful purposes in infringing public spaces.

8. Despite the complexity and uncertain relationship between surveillance and privacy, it is required that Pakistani stakeholders agree on a national law to standardize an enforcement mechanism in order to keep a balance between the civil liberties and security concerns simultaneously.

9. Adequate procedural laws should be developed to regulate use of CCTV cameras by the public and private sector as capabilities of these sensors have dire social and legal consequences due to technological advancements in the field of smart technologies i.e. artificial intelligence. Although PSCA has promulgated Electronic Data Regulations 2016 and DP3 but there is a need to expand such regulations towards a substantive law since several other agencies are also using surveillance measures in the name of protection of premises but the areas under surveillance are much wider and broader than their own purpose.

10. The Police officers and other users of CCTV systems should be educated about privacy laws and procedures. This training and education should be accompanied by some form of a non- disclosure agreement which must prohibit the propagation of anything learned

from the video surveillance system to unauthorized outsiders, similar to the secrecy of correspondence.

11. PSCA needs to act proactively and follow up with the government to formally acknowledge Privacy as a fundamental human right in light of international obligations of Pakistan and as an active member of United Nations. PSCA has already submitted a draft amendment to the government in addition to a draft substantive law for provincial regulatory authorities like PSCA who should be made responsible for ensuring the protection of privacy rights of people of Pakistan while conceiving, designing, implementing and operating Safe Cities Projects or any other surveillance networks.

12. At national level, a Safe or smart Cities regulatory mechanism should also be established to ensure integration and standardization of mass surveillance systems for ensuring a balance between security and privacy rights of the people. As an interim arrangement, PSCA may be a national body to set standards, permit, and regulate all CCTV or other relevant networks which have a potential to infringe on privacy of the people of Pakistan.

References

I. f. E. P. (IEP). (2017). *Global Terrorism Index - 2017*. Retrieved from

I. f. E. P. (IEP). (2019). Global Terrorism Index 2019.

H. Abbas. (2009). Police & law enforcement reform in Pakistan: Crucial for counterinsurgency and counterterrorism success. *Institute for Social Policy and Understanding, 16*.

H. Abbas. (2011). Reforming Pakistan‘s police and law enforcement infrastructure. *US Institute of Peace, Washington, DC*.

M. N. N. Abdul;, S. Chan;, & A. Ahmad;. (2012). Information Leakage through Online Social Networking: Opening the Doorway for Advanced Persistence Threats. *Research Gate*.

A. Acquisti, & R. Gross. (2009). Predicting social security numbers from public data. *Proceedings of the National academy of sciences, 106*(27), 10975-10980.

K. S. Adnan. (2006). Pakistan's foreign policy in the changing international scenario. *The Muslim World, 96*(2), 233.

D. N. Ahmed. (2013). Growing urbanisation: Shifting sands.

R. Ahmed. (2019). Pakistanis are pissed off about their privacy after images of private mements in cars were leaked last night.

N. Ali, S. Abbas, & M. Shahid. (2017). Proposed Framework of Smart City for Gawadar, Balochistan Pakistan. *Research Gate, 6*(436), 2. doi:10.4172/2162-6359.1000436

Z. Anwar. (2013). Pakistan and the Geopolitics of Supply Routes to Afghanistan. *Journal of Political Studies, 20*(2), 105.

P. S. C. Authority. Retrieved from https://www.psca.gop.pk/

P. S. C. Authority. (2015). *Concept Paper - PSCA*.

Ayn Rand, Nathaniel Branden, & R. H. Alan Greenspan. (1986). *Capitalism: The unknown ideal*: Penguin.

M. Azeem. (2019). Leaked Safe City images spark concern among citizens.

N. Bahadar, S. Ullah, I. Nyborg, & T. Maqsood. (2019). Community-Oriented Policing: Political, Institutional and Technical Reforms in Khyber Pakhtunkhwa (KP) Police. *Journal of Human Security, 15*(2), 41-53.

M. I. Bahrawar Jan, Iftikharuddin. (2008). Urbanization trend and urban population projections of Pakistan using weighted approach. *24*(1).

I. J. Bateman, R. T. Carson, B. Day, M. Hanemann, N. Hanley, T. Hett*, et al.* (2002). Economic valuation with stated preference techniques: a manual. *Economic valuation with stated preference techniques: a manual.*

M. Batty, K. W. Axhausen, F. Giannotti, A. Pozdnoukhov, A. Bazzani, M. Wachowicz*, et al.* (2012). Smart cities of the future. *The European Physical Journal Special Topics, 214*(1), 481-518.

M. E. Ben-Akiva, & S. R. Lerman. (1985). *Discrete choice analysis: theory and application to travel demand* (Vol. 9): MIT press.

C. J. Bennett. (2005). What happens when you book an airline ticket? The collection and processing of passenger data post-9/11. *Global surveillance and policing*, 113-138.

D. Bennett, D. Pérez-Bustamante, & M.-L. Medrano. (2017). Challenges for Smart Cities in the UK. In *Sustainable Smart Cities* (pp. 1-14): Springer.

K. W. Bowyer. (2004). Face recognition technology: security versus privacy. *IEEE Technology and society magazine, 23*(1), 9-19.

A. A. Braga, A. V. Papachristos, & D. M. Hureau. (2014). The effects of hot spots policing on crime: An updated systematic review and meta-analysis. *Justice quarterly, 31*(4), 633-663.

T. Brandt, B. Donnellan, W. Ketter, & R. T. Watson. (2016). *Information systems and smarter cities: towards an integrative framework and a research agenda for the discipline.* Paper presented at the AIS Pre-ICIS Workshop—ISCA.

G. Burchell, A. Davidson, & M. Foucault. (2008). *The birth of biopolitics: Lectures at the Collège de France, 1978-1979*: Palgrave Macmillan New York.

A. Burt;, & D. Geer;. (2017). The End of Privacy Retrieved from https://www.nytimes.com/2017/10/05/opinion/privacy-rights-security-breaches.html

A. Butt, M. Naaranoja, & J. Savolainen. (2016). Project change stakeholder communication. *International Journal of Project Management, 34*(8), 1579-1595.

L. Candela. Urbanization and the Development of Cities.

CDHRI. (2012). Cairo Declaration of Human Rights in Islam. Retrieved from https://www.fmreview.org/Human-Rights/cairo

S. Cels, J. De Jong, & F. Nauta. (2012). *Agents of change: strategy and tactics for social innovation*: Brookings Institution Press.

A. Chaudhary. (2020). Budgetary constraints an obstacle to Punjab police performance. *Dawn*.

P. I. Cheema. (2011). *Security Threats Confronting Pakistan*.

M. G. Chitkara. (1997). *Human rights in Pakistan*: APH Publishing.

M. Choudhary. (2019). What is intelligent transport system and how it works?

D. A. Chowdhry, A. Hussain, M. Z. U. Rehman, F. Ahmad, A. Ahmad, & M. Pervaiz. (2013). *Smart security system for sensitive area using face recognition.* Paper presented at the 2013 IEEE Conference on Sustainable Utilization and Development in Engineering and Technology (CSUDET).

T. Christiansen. (2002). A maturing bureaucracy?: The role of the Commission in the policy process. In *European Union* (pp. 77-95): Routledge.

I. A. Cîrdei. (2019). The Impact of Globalization on the Security Environment.

R. Clarke. (2014). The regulation of civilian drones' impacts on behavioural privacy. *Computer Law & Security Review, 30*(3), 286-305.

E. Clayton. (2005). Aristotle: Politics. Retrieved from https://www.iep.utm.edu/aris-pol/

P. Cluskey. (2017). Why hackers may turn their attention to Angela Merkel. Retrieved from Why hackers may turn their attention to Angela Merkel

Opinion on video surveillance in public places by public authorities & the protection of human rights, (2007).

T. H. o. Commons. (2007-08). *Home Affairs Committee: Evidence*. Retrieved from

T. H. o. Commons. (2008). *A Surveillance Society?* . Retrieved from https://publications.parliament.uk/pa/cm200708/cmselect/cmhaff/58/58i.pdf

T. H. o. Commons. (2008). *A Surveillance Society?* . Retrieved from https://publications.parliament.uk/pa/cm200708/cmselect/cmhaff/58/58i.pdf

Constitution Pakistan. (1973). *The Constitution of the Islamic Republic of Pakistan*. Government of Pakistan Retrieved from http://www.na.gov.pk/uploads/documents/1333523681_951.pdf

N. R. Council. (2007). Engaging privacy and information technology in a digital age.

CPNI. (2007). Centre for the Protection of National Infrastructure. Retrieved from https://www.cpni.gov.uk/

T. Craig, & M. E. Ludloff. (2011). *Privacy and big data: the players, regulators, and stakeholders*: " O'Reilly Media, Inc.".

Convention on the Rights of the Child, (1989).

The Code of Criminal Procedure, (1898).

CRS. (1982). Sample Size Calculator. Retrieved from https://www.surveysystem.com/sscalc.htm#one

N. Daur. (2019). People are disgusted as private pictures of passengers leaked allegedly by Safe City Authorities.

DAWN. (2019). LCH requested to declare 'secret filming' Illegal. *DAWN*. Retrieved from https://www.dawn.com/news/1521575

DAWN. (2020). Half of Lahore no more on Safe City radar. Retrieved from https://www.dawn.com/news/1528000

M. Deakin, & L. Leydesdorff. (2013). The triple helix model of smart cities: a neo-evolutionary perspective. In *Smart Cities* (pp. 146-161): Routledge.

S. Dinda. (2008). Social capital in the creation of human capital and economic growth: A productive consumption approach. *The Journal of Socio-Economics, 37*(5), 2020-2033.

T. Dinev. (2014). Why would we care about privacy? In: Springer.

S. Dirks, & M. Keeling. (2009). A vision of smarter cities: How cities can lead the way into a prosperous and sustainable future. *IBM Institute for business Value, 8*.

DP3. (2020). *Data & Privacy Protection Procedures (DP3)*. Retrieved from https://psca.gop.pk/assets/pdffiles/PrivacyPolicy(DP3).pdf

P. P. DPP. (2018). SAFE CITY IS A MARVELOUS PROJECT OF MODERN TECHNOLOGY... [Press release]

T. Dragu. (2011). Is there a trade-off between security and liberty? Executive bias, privacy protections, and terrorism prevention. *American Political Science Review, 105*(1), 64-78.

B. Duignan. (2001). USA PATRIOT Act. *Brittanica*.

Convention for the Protection of Human Rights and Fundamental Freedoms, (1950).

T. Economist. (2019). Safe cities Index 2019. *The Economist*.

B. Einsig, & M. Massott. (2005). *Command & Control: Electronic Security Systems Integration Post 9/11.* Paper presented at the Rail Transit Conference, 2005American Public Transportation Association.

G. Elmer. (2012). Panopticon-discipline-control. *Routledge handbook of surveillance studies, 21*, 29.

T. I. Emerson. (1970). *The system of freedom of expression*: Random House Trade.

Electronic Transaction Ordinance 2002., (2002).

C. C. L. EU. (2011-2019). Europeon Cyber Crime Law. *Europeon Commision*. Retrieved from https://ec.europa.eu/home-affairs/what-we-do/policies/cybercrime_en

S. Feldstein. (2019). The Global Expansion of AI Surveillance. *The Global Expansion of AI Surveillance.* Retrieved from https://carnegieendowment.org/2019/09/17/global-expansion-of-ai-surveillance-pub-79847).

G. o. t. P. Finance Department. (2020). Annual Budget & ADP. Retrieved from https://finance.punjab.gov.pk/annual_budget

M. Foucault. (1977). Discipline and punish: The birth of the prison, trans. AM Sheridan-Smith. *London: Tavistock Publishers*, 1978-1985.

M. Foucault. (1977). Discipline and punishment. In: London: Allen Lane.

D. R. Foundation. (2018). *The Right to Privacy in Pakistan's Digital Spaces: April 2018 Human Rights Council Report* Retrieved from https://www.ohchr.org/Documents/Issues/DigitalAge/ReportPrivacyinDigitalAge/DigitalRightsFoundation.pdf

J. Frankenfield. (2019). Behavioral Analytics. *Behavioral Analytics.* Retrieved from https://www.investopedia.com/terms/b/behavioral-analytics.asp

B. Franklin. (1755). Those who would give up Essential Liberty to purchase a little Temporary Safety, deserve neither Liberty nor Safety. *Speech to the Pennsylvania Assembly*.

R. E. Freeman, J. S. Harrison, & A. C. Wicks. (2007). *Managing for stakeholders: Survival, reputation, and success*: Yale University Press.

C. J. Friedrich. (2017). Secrecy versus privacy: The democratic dilemma. In *Privacy and Personality* (pp. 105-120): Routledge.

U. S. C. General. (2019). *Pakistan 2019 Crime & Safety Report: Lahore*. Retrieved from

T. Gerety. (1977). Redefining privacy. *Harv. CR-CLL Rev., 12*, 233.

I. Ghani. (2019). PAKISTAN'S RESPONSE TO EXTREMISM AND TERRORISM. Retrieved from https://ndu.edu.pk/issra/issra_pub/articles/issra-paper/ISSRA_Papers_1st_Half_2019/01-Pakistans-Response-to-Extremism.pdf

L. Goodmark. (2015). Hands up at home: Militarized masculinity and police officers who commit intimate partner abuse. *BYU L. Rev.*, 1183.

PUNJAB SAFE CITIES AUTHORITY

SERVICE REGULATIONS, 2017, (2017).

C. Grown. (2005). *Taking Action: Achieving Gender Equality and Empowering Women*: Earthscan.

T. Guardian. (2019). The Guardian view on surveillance: Big Brother is not the only watcher now. Retrieved from https://www.theguardian.com/commentisfree/2019/aug/13/the-guardian-view-on-surveillance-big-brother-is-not-the-only-watcher-now

M. Haider. (2018). Cabinet to consider security of bureucrats tenure. *International-The News*.

J. H. Hannah Ritchie, Cameron Appel and Max Roser. (2019). Terrorism. *Ourworldindata*. Retrieved from https://ourworldindata.org/terrorism

L. Harding. (2016). What are the Panama Papers? A guide to history's biggest data leak. *The guardian*.

L. Harris, & A. Westin. (1996). The 1996 Equifax-Harris consumer privacy survey. *New York: Louis Harris and Associates*.

D. Hassan, & S. Masood;. (2017). Suicide bomber kills 13 at protest in Lahore, Pakistan.

T. Hassan. (2001). Aghanistan complex situation and its implications on Pakistan.

M. A. Hayat. (2007). Privacy and Islam: From the Quran to data protection in Pakistan. *Information & Communications Technology Law, 16*(2), 137-148. doi:10.1080/13600830701532043

A. O. Hirschman. (1981). *Essays in trespassing: Economics to politics and beyond*: CUP Archive.

J. Hoggett, P. Redford, D. Toher, & P. White. (2019). Challenges for police leadership: Identity, experience, legitimacy and direct entry. *Journal of Police and Criminal Psychology, 34*(2), 145-155.

R. G. Hollands. (2008). Will the real smart city please stand up? Intelligent, progressive or entrepreneurial? *City, 12*(3), 303-320.

Holy Quran, Surah Al-Hujurat (49:12).

Holy Quran, Surah An-Nur (24:27).

Holy Quran, Surah An-Nur (24:28).

S. Hussain. (2017). *PORTRAYAL AND IMAGE OF PUNJAB EMERGENCY SERVICE (RESCUE 1122) IN LEADING PAKISTANI NEWSPAPERS AND PUBLIC SURVEY OF LAHORE CITY.*

B. W. Husted, & D. B. Allen. (2010). *Corporate social strategy: Stakeholder engagement and competitive advantage*: Cambridge University Press.

ICCPR. (1976). International Covenant on Civil and Political Rights.

Adopted by the General Assembly of the United

Nations on 19 December 1966. Retrieved from https://treaties.un.org/doc/publication/unts/volume%20999/volume-999-i-14668-english.pdf

The Information for Fair Trial Act 2014, (2014).

N. D. India Today. (2017). Pakistan: Suicide blast rocks Lahore's Mall road, 16 including 2 senior cops killed. *India Today, New Delhi*.

A. Ingólfsson. (2019). COMMUNICATING VISION AND STRATEGY. *mango.agropuls.ru*, 23.

P. International. (2019). *State of Privacy Pakistan*. Retrieved from Online: https://privacyinternational.org/state-privacy/1008/state-privacy-pakistan

T. N. International. (2020). Threat alert issued for Lahore. *The News International*.

M. Isaac, & S. Frenkel. (2019). Facebook security breach exposes accounts of 50 million users (2018). In.

T. o. Islamabad. (2018). E-Challan: For the first time in the history of Pakistan, a modernised western system implemented. *Times of Islamabad*.

G. M. Ivan Turok. (2013). Urbanization and economic growth: the arguments and evidence for Africa and Asia. *Sage journals*.

J. L. Jespersen, A. Albrechtslund, P. Ohrstrom, P. Hasle, & J. Albretsen. (2007). *Surveillance, persuasion, and panopticon.* Paper presented at the International Conference on Persuasive Technology.

S. Jillani. (2014). Gunmen kill 13 at Karachi's Jinnah International Airport. *BBC News*.

M. Johnson, & C. Gearty. (2007). Civil liberties and the challenge of terrorism. *British social attitudes, 23*, 143.

R. R. Johnson. (2015). Police organizational commitment: The influence of supervisor feedback and support. *Crime & Delinquency, 61*(9), 1155-1180.

A. N. Joinson, C. Paine, T. Buchanan, & U.-D. Reips. (2006). Watching me, watching you: privacy attitudes and reactions to identity card implementation scenarios in the United Kingdom. *Journal of Information Science, 32*(4), 334-343.

Justia. (1983). United States v. Knotts, 460 U.S. 276. Retrieved from https://supreme.justia.com/cases/federal/us/460/276/

G. H. Kathlyn. (2012). Woman: Person or Property? Retrieved from https://www.huffpost.com/entry/woman-person-or-property-_b_1282620

W. Kenton. (2019). The Panama Papers: What You Should Know. Retrieved from https://www.investopedia.com/terms/p/panama-papers.asp

S. Khalil. (2014). Pakistan Taliban: Peshawar school attack leaves 141 dead. *BBC News*.

A. Khan, Wajid;. (2019). Capacity development challenges in the way. *Sustainable Development Policy Institute*.

A. N. Khan. (2015). *Rule of Law through Technology Oriented Policing*. Retrieved from https://ankltd.com/pakistan-rule-of-law-through-technology-oriented-policing/

A. N. Khan. (2018). PSCA system assisting LEAs in preventing crime, post-event probes. *The Nation*.

A. N. Khan. (2019). Reimagining Policing. *TEDxLahore.* Retrieved from https://www.youtube.com/watch?v=fljjUId6ecw

https://www.supernewsworld.com/Reimagining-Policing---A-Technology-Oriented-Approach--Akbar-Nasir-Khan--TEDxLahore-10461366.html

A. N. Khan (Producer). (2019). Reimagining Policing - A Technology Oriented Approach. *TEDxLahore*.

A. N. Khan. (2019). Surveillance, security and privacy. *The Nation*.

M. Z. Khan. (1980). *Muhammad, seal of the prophets*: Majlis Khuddamul Ahmadiyya.

S. Khan. (2019). *Battling Orwellian surveillance*. Retrieved from

U. A. Khan. (2005). *Trespassing: A Novel*: Macmillan.

A. Khanna, R. Goyal, M. Verma, & D. Joshi. (2018). *Intelligent Traffic Management System for Smart Cities.* Paper presented at the International Conference on Futuristic Trends in Network and Communication Technologies.

H. Khawar. (2017). Lahore - World's largest city in 2050. *The Express - Tribune*.

U. Khilji. (2019). Dangerous surveillance. Retrieved from https://www.dawn.com/news/1523635

H. Koskela. (2000). 'The gaze without eyes': video-surveillance and the changing nature of urban space. *Progress in Human Geography, 24*(2), 243-265.

L. Kozlowski. (2012). Globalization To Digitization: How To Finance Smart Cities. *Forbes*. Retrieved from https://www.forbes.com/sites/lorikozlowski/2012/09/19/globalization-to-digitization-how-to-finance-smart-cities/#6125bde7613e

S. Kreft;, D. Eckstein;, L. Dorsch;, & L. Fischer;. (2016). *Global Climate Risk Index 2016*. Retrieved from https://germanwatch.org/en/11366

P. Kumaraguru, & L. F. Cranor. (2005). *Privacy indexes: a survey of Westin's studies*: Carnegie Mellon University, School of Computer Science, Institute for ….

N. G. La Vigne, S. S. Lowry, J. A. Markman, & A. M. Dwyer. (2011). Evaluating the use of public surveillance cameras for crime control and prevention.

Washington, DC: US Department of Justice, Office of Community Oriented Policing Services. Urban Institute, Justice Policy Center.

Law.gov. (2018). The Library of Congress. *In Custodia Legis*. Retrieved from https://www.loc.gov/law/help/online-privacy-law/2012/germany.php

S. B. Letaifa. (2015). How to strategize smart cities: Revealing the SMART model. *Journal of business research, 68*(7), 1414-1419.

M. Levi, & D. S. Wall. (2004). Technologies, security, and privacy in the post-9/11 European information society. *Journal of law and society, 31*(2), 194-220.

Mall Road Traders Association Versus The Deputy Commissioner, Lahore, (2018).

F. Liang, V. Das, N. Kostyuk, & M. M. Hussain. (2018). Constructing a data-driven society: China's social credit system as a state surveillance infrastructure. *Policy & Internet, 10*(4), 415-453.

T. E. Light. (2014). Globalization and Digitization leading to Smart Cities. *Forbes*. Retrieved from ttp://www.forbes.com/sites/lorikozlowski/2012/09/19/globalization-to-digitization-how-to-finance-smart-cities/

G. Llopis. (2014). Every leader must be a change agent or face extinction.

J. Locke. (1824). *The works of John Locke: in nine volumes* (Vol. 7): C. and J. Rivington.

J. Locke, & P. H. Nidditch. (1979). The Clarendon edition of the works of John Locke: An essay concerning human understanding.

L. H. N. Louis Matsakis. (2020). Everything We Know About Jeff Bezos Phone Hack. Retrieved from https://www.wired.com/story/bezos-phone-hack-mbs-saudi-arabia/

R. W. Lucky. (2008). *Zero Privacy*. Retrieved from www.spectrum.IEEE.org

D. Lyon. (2001). *Surveillance society: Monitoring everyday life*: McGraw-Hill Education (UK).

S. Malik. (2018). Security Sector Reforms in Pakistan. *Strategic Studies, 38*(3), 1-21.

S. Malik. (2018). Security Sector Reforms in Pakistan: Significance, Challenges and Impediments. *Strategic Studies, 38*(3).

P. K. Manning. (2008). *The technology of policing: crime mapping, information technology, and the rationality of crime control* (Vol. 4): NYU Press.

R. A. Marks. (2010). *Spying in America in the post 9/11 world: domestic threat and the need for change*: ABC-CLIO.

A. Martin. (2008). Digital literacy and the "digital society". *Digital literacies: Concepts, policies and practices, 30*, 151-176.

G. T. Marx. (2002). What's New About the" New Surveillance"? Classifying for Change and Continuity. *Surveillance & Society, 1*(1), 9-29.

L. Matsakis, & I. Lapowsky. (2018). Everything We Know About Facebook's Massive Security Breach'. In: Wired.

N. Matthew. (2016). Informal Agencies of Influence: The Interdependence of Social, Religious, and Political Trends in Pakistan. In: Mapping Pakistan's Internal Dynamics.

M. McCahill. (2007). Us and them - the social impact of

'new surveillance' technologies. *Crime & Justice*. Retrieved from https://www.crimeandjustice.org.uk/sites/crimeandjustice.org.uk/files/09627250708553275.pdf

G. McNeal. (2014). *Drones & Aerial Surveillance: Consideration for Legislature.* Retrieved from

T. L. McPhail. (2010). *Global communication: Theories, stakeholders, and trends*: John Wiley & Sons.

A. Mento, R. Jones, & W. Dirndorfer. (2002). A change management process: Grounded in both theory and practice. *Journal of Change Management, 3*(1), 45-59.

D. Meyar. (2019). Google and ad industry accused of massive abuse of intimate personal data.

J. S. Mill. (1892). On liberty.

N. H. Mirza. (2018). Lahore Traffic police kick-start e-challan system for violators.

Mladen. (2009). Traffic Index. Retrieved from https://www.numbeo.com/traffic/rankings_current.jsp

MOI. (2014). *National Internal Security Policy 2014-2018* Ministry of Interior Retrieved from https://nacta.gov.pk/wp-content/uploads/2017/08/National-Internal-Security-Policy-2014.pdf

R. J. Mukama. (2019). REGULATION OF PRIMARY SACCOS'CREDIT ADVANCEMENT IN TANZANIA. *East African Journal of Social and Applied Sciences (EAJ-SAS), 1*(1).

C. Muriana, & G. Vizzini. (2017). Project risk management: A deterministic quantitative technique for assessment and mitigation. *International Journal of Project Management, 35*(3), 320-340.

NACTA. (2014). National Counter Terrorism Authority Retrieved from https://nacta.gov.pk/

National Internal Security Policy, (2014).

NAP. (2019). *A decadal survey of the social and behavioral sciences: A research agenda for advancing intelligent analysis*: NAP.

S. Nash. (2002). Balancing convention rights: PG and JH v United Kingdom. *The International Journal of Evidence & Proof, 6*(2), 125-129.

T. Nation. (2020). Majority satisfied with working of Safe City Authority: Survey. *The Nation*.

T. Nation. (2020). PM visits Safe City Headquarters. *The Nation*.

U. Nations. *The Habitat Agenda Goals andPrinciples, Commitments and theGlobal Plan of Action* Retrieved from https://www.un.org/en/events/pastevents/pdfs/habitat_agenda.pdf

U. Nations. (2014). *World's population increasingly urban with more than half living in urban areas*. Retrieved from
U. Nations. (2017). *World population projected to reach 9.8 billion in 2050, and 11.2 billion in 2100*. Retrieved from
U. Nations. (2018). *68% of the world population projected to live in urban areas bt 2050* Retrieved from
U. Nations. (2018). *World Urbanization Prospects*. Retrieved from
U. Nations. (2019). Growing at a slower pace, world population is expected to reach 9.7 billion in 2050 and could peak at nearly 11 billion around 2100.
P. K. Nayar. (2015). *The postcolonial studies dictionary*: John Wiley & Sons.
P. S. A. Nelson. (2018). Natural Hazards and Natural Disasters.
N. Newman. (2014). The costs of lost privacy: consumer harm and rising economic inequality in the age of Google. *William Mitchell Law Review, 40*(2).
I.-T. News. (2018). Street crime dropped in two months, claim police.
T. News. (2016). Scope of Punjab Safe Cities Project to be expanded: CM. *The News*.
D. Neyland. (2006). *Privacy, surveillance and public trust*: Springer.
F. Nilsson. (2016). *Intelligent network video: Understanding modern video surveillance systems*: CRC Press.
M. Nisar. (2020). Trespassing a Fusion of Linguistic Approaches. *International Multidisciplinary Research Journal*. Retrieved from http://updatepublishing.com/journal/index.php/imrj/article/view/5521
H. Nissenbaum. (1997). Toward an approach to privacy in public: Challenges of information technology. *Ethics & Behavior, 7*(3), 207-219.
H. Nissenbaum. (1998). Protecting privacy in an information age: The problem of privacy in public. *Law and Philosophy*, 559-596.
H. Nissenbaum. (2004). Toward an approach to privacy in public: Challenges of information technology. *Readings in cyberethics*, 450-461.
H. Nissenbaum. (2011). A contextual approach to privacy online. *Daedalus, 140*(4), 32-48.
C. Norris, & G. Armstrong. (1999). *The maximum surveillance society: The rise of CCTV* (Vol. 2): Berg Oxford.
M. O'Brien. (2008). Law, privacy and information technology: a sleepwalk through the surveillance society? *Information & Communications Technology Law, 17*(1), 25-35.
K. O'Hara. (2011). *Transparent government, not transparent citizens: a report on privacy and transparency for the Cabinet Office*. Retrieved from
J. Obermaier, & M. Hutle. (2016). *Analyzing the security and privacy of cloud-based video surveillance systems.* Paper presented at the Proceedings of the 2nd ACM international workshop on IoT privacy, trust, and security.
A. Odlyzko. (2004). Privacy, economics, and price discrimination on the Internet. In *Economics of information security* (pp. 187-211): Springer.

Article 164, Production of evidence that has become available because of modern devises, etc., (1984).

G. Orwell. (1984). New York: Signet Classic.

J. Pallero;, & V. Arroyo;. (2018). your data used against you: reports of manipulation on whatsapp ahead of Brazil's election. Retrieved from https://www.accessnow.org/your-data-used-against-you-reports-of-manipulation-on-whatsapp-ahead-of-brazils-election/

F. L. D. a. M. A. Paludi. (2008). *Psychology of Women: A Handbook of Issues & Theories*: Praeger Publishers.

A. Pande. (2011). *Explaining Pakistan's foreign policy: escaping India*: Routledge.

W. A. Parent. (2017). Privacy, morality, and the law. In *Privacy* (pp. 105-124): Routledge.

M. A. Paryani. (2011). Corporate social responsibility, the role of stakeholders and sustainable development: A case study of Pakistan. *Cell, 92*, 333-3755278.

S. Patil, D. Potoglou, H. Lu, N. Robinson, & P. Burge. (2014). Trade-off across privacy, security and surveillance in the case of metro travel in Europe. *Transportation Research Procedia, 1*(1), 121-132.

Prevention of Electronic Crimes Act, 2016, (2016).

Policy. (2016). *Privacy Policy of PSCA*. Retrieved from http://psca.gop.pk/PSCA/privacy-policy/(

Protection of Pakistan Act, (2014).

PPIC3. (2015). *Concept Paper*. Retrieved from https://www.psca.gop.pk/AboutUs/KnowledgeBase

PSCA. (2019). Punjab Safe City Authority. Retrieved from https://www.psca.gop.pk/AboutUs/KnowledgeBase. https://www.psca.gop.pk/AboutUs/KnowledgeBase

PSCA. (2015). *Concept Paper - PSCA*.

PSCA.TV (Writer). (2019). Privacy Policy and Safe City's Camera | PSCA -TV | Life Saver EP-01. In.

PTV (Writer). (2016). Pakistan This Week with Mansoor Azam Qazi In.

PWD. (2017). *Punjab District Wise Population Census 2017*. Retrieved from https://www.pwd.punjab.gov.pk/system/files/split%20and%20merged.pdf

X. Qiang. (2019). The Road to Digital Unfreedom: President Xi's Surveillance State. *Journal of Democracy, 30*(1), 53-67.

Qanun I Shahadat Order, 1984 (X OF 1984) (1984).

I. A. Rana, & S. S. Bhatti. (2018). Lahore, Pakistan–Urbanization challenges and opportunities. *Cities, 72*, 348-355.

M. A. Randol. (2010). *The department of Homeland security intelligence enterprise: Operational overview and oversight challenges for congress*. Retrieved from

A. C. Raul. (2018). *Data Protection, Cyber Security Law Review* (4 ed.). UK.

A. C. Raul. (2018). *The privacy, data protection and cybersecurity law review*: Law Business Research Limited.

S. H. Raza, & B. Mehmood. (2014). Efficiency differences among law enforcing units in Punjab, Pakistan: Application of data envelopment analysis. *Pakistan Journal of Applied Economics, 24*(1), 17-37.

J. R. Reidenberg. (2014). Privacy in public. *U. Miami L. Rev., 69*, 141.

Reuters. (2020). Coronavirus brings China's surveillance state out of the shadows. Retrieved from https://tribune.com.pk/story/2152618/8-coronavirus-brings-chinas-surveillance-state-shadows/

N. M. Richards. (2013). The dangers of surveillance. *Harvard Law Review, 126*, 19-34.

N. M. Richards, & J. H. King. (2014). Big data ethics. *Wake Forest L. Rev., 49*, 393.

A. Richardson. (2015). *The Future of Public Safety System*(pp. 1-20).

RIPA. (2000). *UK's Regulation of Investigatory Powers Act (RIPA), Article 8*.

N. Robinson, & D. Potoglou. (2010). Security, at what cost? A stated preference approach toward understanding individuals' privacy and civil liberties trade-offs regarding security measures.

N. Robinson, D. Potoglou, C. W. Kim, P. Burge, & R. Warnes. (2010). Security, At What Cost?: Quantifying people's trade-offs across liberty, privacy and security.

M. Roser. (2019). Future population growth Retrieved from https://ourworldindata.org/future-population-growth

J. Rule. (1973). Private Lives. *Public Surveillance: Social Control in the Information Age Allen Lane, London*.

Punjab Police Rules, (1934).

R. Rumi. (2015). *Charting Pakistan's Internal Security Policy*. Retrieved from

J. Sadowski, & F. A. Pasquale. (2015). The spectrum of control: A social theory of the smart city. *First Monday, 20*(7).

S. Safi. (2014). National Internal Security Policy: An Analysis. *Pakistan Institute of Legislative Development and Transparency*.

SAS. (2020). Big Data Analytics. Retrieved from https://www.sas.com/en_us/insights/analytics/big-data-analytics.html

SATP. (2019). South Asian Terrorism Portal Index. Retrieved from https://www.satp.org/satporgtp/countries/pakistan/

B. E. Sawe. (2019). *The Largest Cities In Pakistan*. Retrieved from

P. Schneider. (2011). Terror blacklists on trial: smart sanctions challenged by human rights. In *Human Rights in the 21st Century* (pp. 150-165): Springer.

F. D. Schoeman. (1984). *Philosophical dimensions of privacy: An anthology*: Cambridge University Press.

C. Seow, R. Hillary, S. S. Gao, & J. J. Zhang. (2006). Stakeholder engagement, social auditing and corporate sustainability. *Business process management journal*.

M. Shahzad. (2017). Safe Cities Authority cost up by Rs810m. *The Express Tribune*.

J. Shaw. (2017). The Watchers. *Harvard Magazine*.

N. Sheikh. (2019). Technology effectively helping police combat crime in Lahore. *The Express-Tribune*.

N. Sheikh. (2020). 4,000 Safe City Cameras offline due to lack of funds. *The Express Tribune*.

J. Silverstein. (2019).

Hundreds of millions of Facebook user records were exposed on Amazon cloud server. *CBS News*.

S. Simitis. (1987). Reviewing privacy in an information society. *University of Pennsylvania Law Review, 135*(3), 707-746.

C. Slobogin. (2002). Public privacy: camera surveillance of public places and the right to anonymity. *Miss. lJ, 72*, 213.

E. Snowden. (2019). Edward Snowden in Russian Exile;" You have to be ready to stand for something". In E. MacAskill (Ed.).

O. Solon. (2018). Facebook faces $1.6 bn fine and formal investigation over massive data breach. *The Guardian News, https://www. theguardian. com/technology/2018/oct/03/facebook-data-breach-latest-fineinvestigation, accessed on, 2*(11), 2018.

D. J. Solove. (2012). Introduction: Privacy self-management and the consent dilemma. *Harv. L. Rev., 126*, 1880.

B. C. Stahl. (2007). Privacy and security as ideology. *IEEE Technology and society magazine, 26*(1), 35-45.

P. B. o. Statistics. (2017). Province-wise provincial results of census-2017. Retrieved from http://www.pbs.gov.pk/sites/default/files/PAKISTAN%20TEHSIL%20WISE%20FOR%20WEB%20CENSUS_2017.pdf

D. J. Steinbock. (2004). National Identity Cards: Fourth and Fifth Amendment Issues. *Fla. L. Rev., 56*, 697.

K. Stenson. (1993). Community policing as a governmental technology: Community policing as a governmental technology. *Economy and Society, 22*(3), 373-389.

D. W. Stephens, J. Hill, & S. F. Greenberg. (2011). *Strategic communication practices: a toolkit for police executives*: US Department of Justice, Office of Community Oriented Policing Services.

S. M. Stern. (2011). Smart-grid: technology and the psychology of environmental behavior change. *Chi.-Kent L. Rev., 86*, 139.

B. Steyn, & M. Nunes. (2001). Communication strategy for community development: a case study of the Heifer project–South Africa.

K. Strom. (2017). Research on the impact of technology on policing strategy in the 21st century, final report. In: Washington, DC: US Department of Justice.

M. S. Suddle. (2003). Reforming Pakistan Police: An Overview. *United Nations Asia and*.

R. Surette. (2005). The thinking eye. *Policing: An International Journal of Police Strategies & Management*.

F. Z. Syed, & S. Javed. (2017). Deterrence: A Security Strategy against Non Traditional Security Threats to Pakistan. *International Journal of Social Sciences and Management, 4*(4), 267-274.

M. A. Syed, & F. Sardar. PERCEPTION OF THE STUDENTS REGARDING ADAPTABILITY OF MULTIPLE INTELLIGENCES AT ELEMENTARY LEVEL IN KHYBER PAKHTUNKHWA.

H. Taherdoost. (2017). Determining sample size; how to calculate survey sample size. *International Journal of Economics and Management Systems, 2*.

J. S. O. S. Taner. (2007). Successful Change Management.

N. Taylor. (2002). State surveillance and the right to privacy. *Surveillance & Society, 1*(1), 66-85.

N. Tekin. (2014). An Assessment of the Turkish Draft Law On Protection of Personal Data in Light of the EU Data Protection Directive. *Human Rights Review, 4*(1).

J. Terres. (2020). IS PAKISTAN SAFE IN 2020? ALL YOU NEED TO KNOW.

TheNation. (2020). Majority satisfied with working of Safe City Authority: Survey. *The Nation*.

thenews. (2018). 56 public companies: Nine company heads refuse to return additional salaries. *The News*. Retrieved from https://www.thenews.com.pk/print/394805-56-public-companies-nine-company-heads-refuse-to-return-additional-salaries

thenews. (2020). Work on Safe City Project for Peshawar to start soon. *The News,* p. Bureau Report. Retrieved from https://www.thenews.com.pk/print/602460-work-on-safe-city-project-for-peshawar-to-start-soon

F. S. Tipson. (2013). *Natural Disastersas Threats to Peace*. Retrieved from

K. Tomkins. (2005). Police, law enforcement and the environment. *Current issues in criminal justice, 16*(3), 294-306.

A. Townsend. (2013). Smart Cities. *Big Data, Civic Hackers, and the Quest for a New Utopia*.

Tribune. (2020). Lahore among the 'safest cities' in the world. *Express Tribune.* Retrieved from https://tribune.com.pk/story/2137970/1-lahore-among-safest-cities-world/

T. E. Tribune. (2016). First phase initiated: Safe city comes to life in Lahore. *The Express Tribune*.

R. C. Trojanowicz. (1986). Evaluating a neighborhood foot patrol program: The Flint, Michigan project. *Community crime prevention: Does it work*, 157-178.

F. Ullah. (2017). Critical Assessment: Reforms and Significance of effective Police Training to Counter Terrorism in Khyber Pakhtunkhwa Pakistan. *Pakistan Journal of Criminology, 9*(3), 121.

UNCTAD. (2017). World Investment Report-2017.

UNDHR. (1946). Article-12, Universal Declaration of Human Rights. Retrieved from https://www.un.org/en/universal-declaration-human-rights/

UNHABITAT. (1996). United Nations Human Settlement Programme. Retrieved from https://unhabitat.org/

United States VS Knotts, (1982-1983).

THE USA PATRIOT Act, (2010).

T. van den Broek, M. Ooms, M. Friedewald, M. van Lieshout, & S. Rung. (2017). Privacy and security: Citizens' desires for an equal footing. In *Surveillance, privacy and security* (pp. 15-35): Routledge.

L. Van Zoonen. (2016). Privacy concerns in smart cities. *Government Information Quarterly, 33*(3), 472-480.

R. Wacks. (1993). *Personal information: Privacy and the law*: Clarendon Pr.

A. Wakefield. (2006). *The value of foot patrol: A review of research*: Police Foundation London.

P. R. Walker. (2005). Human settlements and urban life: A United Nations perspective. *Journal of Social Distress and the Homeless, 14*(1-2), 65-71.

X. Wang. (2013). Intelligent multi-camera video surveillance: A review. *Pattern recognition letters, 34*(1), 3-19.

N. R. P. K. B. Warnes. (2010). Security At What Cost? *International Conference on Critical Infrastructure ProtectionSpringer, Berlin, Heidelberg* 3-15. Retrieved from https://link.springer.com/chapter/10.1007/978-3-642-16806-2_1

S. Warraich. (2019). A long way to go. *The News*.

S. D. Warren, & L. D. Brandeis. (1890). The right to privacy. *Harvard Law Review*, 193-220.

S. Wasif. (2017). Natural disasters 'have inflicted $28.29b losses'. Retrieved from https://tribune.com.pk/story/1531728/natural-disasters-inflicted-28-29b-losses/?__cf_chl_jschl_tk__

M. G. Weinbaum. (1991). Pakistan and Afghanistan: The strategic relationship. *Asian Survey, 31*(6), 496-511.

S. Welsh, A. Hassiotis, G. O'mahoney, & M. Deahl. (2003). Big brother is watching you--the ethical implications of electronic surveillance measures in the elderly with dementia and in adults with learning difficulties. *Aging & mental health, 7*(5), 372-375.

A. F. Westin. (1967). Privacy and freedom Atheneum. *New York, 7*, 431-453.

A. F. Westin. (1970). Privacy and freedom.

Z. Whittaker. (2019). *Hackers leak data on Angela Markel and Hundreds of German lawmakers*. Retrieved from

H. H. Willis, & O. Al-Shahery. (2014). *National Security Perspectives on Terrorism Risk Insurance in the United States*: Rand Corporation.

S. Wong, & N. Brooks. (2015). Evolving risk-based security: A review of current issues and emerging trends impacting security screening in the aviation industry. *Journal of Air Transport Management, 48*, 60-64.

D. M. Wood, & C. W. R. Webster. (2009). Living in surveillance societies: The normalisation of surveillance in Europe and the threat of Britain's bad example. *Journal of Contemporary European Research, 5*(2), 259-273.

I. Zafar. (1999). Impediments to social development in Pakistan. 717-738.

Q. Zaman;, & M. Usman;. (2015). Calamities inflicted Rs. 1.5 trillion losses in five years.

A. S. M. Zehnder. (2010). Camera Surveillance as a Measure of Counterterrorism?

C. Zielinski. (2015). Why women are still the property of men. Retrieved from https://www.dailytelegraph.com.au/rendezview/why-women-are-still-the-property-of-men/news-story/b18f0a4d456db6967e7c05f4f309604f

M. T. Zimmer. (2005). Personal information and the design of vehicle safety communication technologies: An application of privacy as contextual integrity. *Proceedings of AAAS Science & Technology in Society*, 222-226.

M. Zuckerberg. (2018). Mark Zuckerberg's own Facebook data was sold to Cambridge Analytica. Retrieved from https://news.sky.com/story/mark-zuckerbergs-own-facebook-data-was-sold-to-cambridge-analytica-11326718

E. Zureik, & M. Salter. (2013). What happens when you book an airline ticket? The collection and processing of passenger data post-9/11. In *Global surveillance and policing* (pp. 125-150): Willan.

Annexures

Annexure - I

The Punjab Safe Cities Authorities Act

THE PUNJAB SAFE CITIES AUTHORITY ACT 2016
(I OF 2016)

CONTENTS

TEXT

THE PUNJAB SAFE CITIES AUTHORITY ACT 2016
(I OF 2016)

[06th February, 2016]

An Act,

to provide for the establishment of Punjab Safe Cities Authority.

It is necessary to establish Punjab Safe Cities Authority for purposes of construction, development and maintenance of a city-wide integrated command, control and communications (IC3) system in the major cities of the Punjab in order to ensure safety and security of the people, and for other purposes;

Be it enacted by Provincial Assembly of the Punjab as follows:

1. Short title, extent, commencement and application—(1) This Act may be cited as the Punjab Safe Cities Authority Act 2016.

(2) Subject to subsection (4), it shall extend to whole of the Punjab.

(3) It shall come into force at once.

(4) It shall apply to the city of Lahore and such other cities as the Government may, from time to time, by notification in the official Gazette, specify.

2. Definitions—(1) In this Act:

(a) 1 ncillary facilities" include the facilities and equipment provisioned or developed by the Authority including fences, cameras, poles, wiring, antennas, surveillance systems, control rooms, generators, lights, fans and other facilities;

(b) "asset" means moveable and immoveable property owned or controlled by the Authority;

(c) "Authority" means Punjab Safe Cities Authority established under the Act;

(d) "Chairperson" means the Chairperson of the Authority;

(e) "Chief Operating Officer" means the Chief Operating Officer of the Authority;

(f) "city" means the city of Lahore and includes such other city as the Government may specify under subsection (4) of section 1;

(g) "equipment" means all the equipment operated by the Authority throughout the city;

(h) "Executive Committee" means the Executive Committee of the Authority;

(i) "Fund" means the Fund established under the Act;

(j) "Government" means Government of the Punjab;

(k) "IC3" means the Integrated Command, Control and Communication Centre established and maintained by the Authority;

(l) "Management Committee" means the Management Committee of the Authority;

(m) "Managing Director" means the Managing Director of the Authority; and

(n) "prescribed" means prescribed by the rules made or regulations framed under the Act.

(2) An expression used in this Act but not defined shall have same meaning as assigned to it under the Police Order, 2002 (C.E. Order No.22 of 2002)%

43 **The Authority%&**(1)The Government shall, by notification in the official Gazette, establish an Authority to be called Punjab Safe Cities Authority.

(2) The Authority shall consist of the following:

(a)	Chief Minister of the Punjab;	Chairperson
(b)	Vice Chairperson to be nominated by the Chief Minister;	Vice Chairperson
(c)	Minister for Finance, Punjab;	Member
(d)	one member of National Assembly of Pakistan and four public representatives, including three members of Provincial Assembly of the Punjab of whom at least one shall be a woman member of the Assembly to be nominated by the Government;	Members
(e)	Chief Secretary, Punjab;	Member
(f)	Chairman, Planning and Development Board of the Government;	Member
(g)	Provincial Police Officer, Punjab;	Member
(h)	Secretary to the Government, Home Department or his nominee not below the rank of an Additional Secretary;	Member
(i)	Secretary to the Government, Finance Department or his nominee not below the rank of an Additional Secretary;	Member
(j)	Chairman, Punjab Information Technology Board;	Member
(k)	Heads of District Police of the cities to which the Act applies;	Member(s)
(l)	three eminent persons including at least one woman from the general public or academia, having knowledge of and exposure to law enforcement or other related information technology based projects to be nominated by the Government for a specified period;	Members
(m)	Managing Director; and	Member
(n)	Chief Operating Officer.	Member/ Secretary

(3) The Authority shall be a body corporate, having perpetual succession and a common seal with power to acquire, hold and dispose of property and may, by the said name, sue and be sued.

(4) The Authority shall not dispose of any asset without prior permission in writing of the Government.

(5) The Authority shall meet at such time and place and shall observe such procedure with regard to transaction of business at its meetings as may be prescribed, and until so prescribed, as may be directed by the Chairperson.

(6) One half of the total members shall constitute the quorum for a meeting of the Authority.

53 **Powers and functions**%&1) Subject to the provisions of this Act, the Authority may exercise such powers and perform such functions as may be necessary for carrying out the purposes of the Act.

(2) In particular, the Authority shall perform the following functions:

(a) To maintain and develop command, control and communication centers and other related facilities;

(b) to plan, construct and maintain IC3 for future expansion;

(c) to enter into contracts, grant licenses, leases, make other arrangements and to perform all tasks necessary for efficient functioning of IC3;

(d) to incur all necessary expenditure for planning, construction and maintenance of IC3 including administrative expenses;

(e) to acquire, hold and, subject to this Act, dispose of property;

(f) to make adequate arrangements for effective security of equipment and other ancillary facilities;

(g) to establish and maintain an effective oversight mechanism;

(h) to give directions to any person or agency for not interfering in any way with the infrastructure, facilities and smooth functioning of the Authority;

(i) to monitor and enforce contracts including concession agreements, licenses or leases entered into or granted by the Authority;

(j) to constitute a committee for performance of any of the functions of the Authority or to make recommendations to the Authority; and

(k) to perform such other related functions as the Government may assign.

63 **Executive Committee**.–(1) The Authority shall have an Executive Committee consisting of the following:

(a)	Chief Secretary, Punjab;	Chairman
(b)	Secretary to the Government, Home Department or his nominee not below the rank of an Additional Secretary;	Member
(c)	Provincial Police Officer, Punjab;	Member
(d)	Chairman Planning and Development Board, Punjab;	Member
(e)	Secretary to the Government, Finance Department or his nominee not below the	Member

rank of an Additional Secretary;

(f)	Secretary to the Government, Communication and Works Department or his nominee not below the rank of an Additional Secretary;	Member
(g)	Chairman Punjab Information Technology Board;	Member
(h)	Managing Director; and	Member
(i)	Chief Operating Officer.	Member/ Secretary

(2) The Executive Committee shall perform the following functions:

(a) to steer and monitor the projects undertaken by the Authority;
(b) to effect coordination between the Authority and other public sector agencies;
(c) to take appropriate decisions on proposals referred to it by the Management Committee and, if necessary, to refer the same to the Authority for consideration;
(d) to ensure that the functions and targets under the Act are achieved; and
(e) to perform such functions as may be delegated or assigned to it by the Authority.

6. Management Committee%&1) The Authority shall have a Management Committee consisting of the following:

(a)	Provincial Police Officer, Punjab;	Chairman
(b)	Managing Director;	Member
(c)	Heads of District Police of the cities to which the Act applies;	Member
(d)	a representative of the Government, Home Department;	Member
(e)	a representative of the Government, Finance Department;	Member
(f)	a representative of the Government, Planning and Development Department;	Member
(g)	a representative of the Government, Communication and Works Department;	Member
(h)	a representative of the Punjab Information Technology Board; and	Member
(i)	Chief Operating Officer.	Member/ Secretary

(2) The Management Committee shall perform such functions and in such manner as may be prescribed and until so prescribed, as the Authority may assign or determine.

73 **Managing Director**%&1) The Government shall appoint a police officer not below the rank of Deputy Inspector General of Police as Managing Director on such terms and conditions as may be determined by the Government.

(2) The Managing Director shall be the chief executive of the Authority and shall:

(a) perform such functions and exercise such powers as the Authority may assign or delegate; and

(b) ensure that each IC3 facility is ready and at the disposal of the Head of District Police for running police operations in the areas of responsibility.

83 **Chief Operating Officer**%(1) The Government may appoint any person as the Chief Operating Officer on such terms and conditions as may be determined by the Government.

(2) The Chief Operating Officer shall be the secretary of the Authority, Executive Committee and Management Committee.

(3) The Chief Operating Officer shall:

(a) summon meeting of the Authority, Executive Committee or Management Committee on direction of the Chairperson of the Authority or Chairman of the Executive Committee or Management Committee; and

(b) perform such functions as may be assigned to him by the Authority, Executive Committee, Management Committee or Managing Director.

93 **Employees etc.**–(1) The Authority may appoint such officers, experts, consultants and other employees as it considers necessary for efficient performance of its functions, in such manner and on such terms and conditions as may be prescribed and, until so prescribed, as may be approved by the Government.

(2) The Authority may, by regulations, provide for efficiency, discipline and accountability of its employees or adapt any existing rules for the purpose, with such modifications as may be necessary.

10. Fund%(1) There shall be established a fund to be known as the IC3 Fund, which shall vest in the Authority and shall be utilized by the Authority to meet all its expenses and charges in connection with the discharge of its functions and powers under this Act, including the payment of salaries and remuneration to its employees.

(2) All monies credited in the Fund shall be deposited in an account with a Scheduled Bank approved by the Authority.

(3) The Fund shall consist of:

(a) grants from the Government or Federal Government or any other body or organization;

(b) foreign aid;

(c) foreign loans raised by the Authority with the prior approval of the Government and on such terms and conditions as the Government may specify;

(d) proceeds of all charges and income from sale of assets, and any recovery made under the Act; and

(e) such other sums as may be received by the Authority.

11. Accounts%The Authority shall maintain proper accounts and other relevant records and prepare annual statement of accounts in such form as may be prescribed.

12. Budget%&The Management Committee shall prepare, every year, a budget in respect of the next financial year showing the estimated receipts and expenditures of the Authority and shall submit the same to the Authority for approval in such form and at such time as may be prescribed.

13. Audit%&(1) The Auditor General of Pakistan shall audit the accounts of the Authority.

(2) The Managing Director shall, within six months of the close of the financial year, submit the annual statement of accounts along with the report of the auditor to the Authority.

14. Public servants and experts%&(1) The employees of the Authority shall be deemed as public servants in terms of section 21 of the Pakistan Penal Code 1860 (XLV of 1860).

(2) An employee of the Authority working with information technology related matters shall be deemed to be an expert within the meaning of Article 59 of the Qanun-e-Shahadat Order, 1984 (X of 1984), and shall be deemed to have been appointed under section 510 of the Code of Criminal Procedure, 1898 (V of 1898).

15. Delegation%&The Authority may, subject to such conditions as it deems appropriate, delegate to the Chairperson, Vice Chairperson, Executive Committee, Managing Committee, Managing Director or an officer of the Authority any of its functions under this Act, except the following functions:

(a) framing of regulations;
(b) approval of budget; and
(c) determination of terms and conditions, efficiency and discipline of employees of the Authority.

16. Immunity.– No suit, prosecution or any other legal proceedings shall lie against the Authority, the Chairperson, Vice Chairperson, Managing Director, Secretary, any member, officer, employee, expert or consultant of the Authority, in respect of anything done or intended to be done in good faith under this Act.

17. Overriding effect%&In the event of any conflict or inconsistency between this Act and any other law, the provisions of the Act shall, to the extent of such conflict or inconsistency, prevail.

18. Rules%&The Government may, by notification in the official Gazette, make rules for carrying out the purposes of this Act.

19. Regulations%&Subject to this Act and the rules, the Authority may, by notification in the official Gazette, frame regulations for giving effect to the provisions of the Act.

20. Power to remove difficulties%&If any difficulty arises in giving effect to the provisions of this Act, the Government may, by notification, not inconsistent with the provisions of the Act, remove the difficulty.

21. Validation.&Notwithstanding the repeal of the Punjab Safe Cities Authority Ordinance 2015 (XVI of 2015), any action of the Authority or of any person on behalf

of the Authority taken from the date of repeal of the said Ordinance and till the date of commencement of this Act shall be deemed to have been taken under the Act.

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Annexure - II

PPIC3 Centre Project: Scope of Technologies

The PPIC3 Centre is the main data center which is one of the biggest data center of Pakistan used for public safety. The centre is designed with the help of ARUP Consultants of United Kindom and Huawei Technologies Pakistan has been the main vendor for execution of this project starting on May 20, 2016.It is located in Qurban Police Lines and it is an impressive building hosting a set of technologies which are operated with the help of 1024 officers, men and women. It has 666 Police Communication officers working in three shifts and an elaborate technical staff including IT experts, engineers, research analysts and other staff.

The technology scope for the PPIC3 Programme includes the following technologies and systems:

i. CCTV (Close Circuit Television) System

The CCTV system provides images from the 6700 cameras that are installed during phase 1 and phase 2. The cameras will primarily provide images for incident and event management but will also are connected to the analytics systems.

ii. CAD (Computer Assisted Dispatch) System

CAD provides the means to capture the details of an incident. The CAD form initially populated with the caller's details e.g. Name, Telephone/Mobile phone number and location. During the incident resolution the CAD further populated with details of the incident.

iii. ACD (Automatic Call Distribution) System

The ACD distributes both conventional telephone calls and VOIP (Voice of Internet Protocol) calls to the operators within the PP-IC3 Centre and the Police Stations within Lahore. The Programme provides the infrastructure for the Police Stations but not the hardware.

iv. GIS (Geographic Information) System

The GIS provides the operators with a map of the area that they are responsible for. On the map are detailed the position of resources available to them be it technology or operational resources.

v. ICP (Integrated Communications Platform)

The ICP provides a single access point to the LTE Radio network, the VOIP telephone system, the conventional phone system, the legacy radio systems (Tetra, UHF and VHF) and control of the CCTV system.

vi. Crime Record Management System

The Crime Record Management System initially populated from the CRO database is alredy developed by Punjab Police but it will be housed in PPIC3 Centre. However as the PPIC3 System operates it will be update with real time data from the CAD system allowing the intelligence aspect to be added to Police response.

vii. ANPR (Automatic Number Plate Recognition) System

The ANPR system uses dedicated cameras to capture number plates of vehicle passing through their fields of view. This data is used for identifying stolen vehicles, using data from the Excise database and CAD, and also provides data to the analytics systems.

viii. SOPs/FAQ (Standard Operating Procedures/Frequently Asked Questions)

The SOPs/FAQ provides the operators information for managing events and incidents from the SOPs but also provides answers to members of the public for questions they may have concerning the Police.

ix. Gazetteer

The Gazetteer is a database of geographical information that is used to assist in event planning and responses to civil emergencies. The information is displayed on the GIS screen.

x. Resource Management System

The Resource Management System provides the ability to plan the manning of the PP-IC3 Centre using the CRO information.

xi. AVLS (Automatic Vehicle Location System)

The AVLS allows the GIS system, from data from the LTE network, to display the location of all the vehicles that are available for dispatch to incidents or that are being used to manage events.

xii. APLS (Automatic Personal Location System)

The APLS allows the GIS system, from data from the LTE network, to display the location of personal that are available to dispatch to incidents or that are being used to manage events.

xiii. Analytics Systems

The analytical systems being deployed are Facial recognition, Object Tracking, Forensic Analysis, Left Object recognition, Event detection, Vehicle and People counting, Loitering and Counter Flow detection.

xiv. Management System

The management system providesone platform the ability to manage the Phase 1 and Phase 2 systems e.g. Configure on the fly talk groups, define new users on the system, provide rights management for access to cameras etc.

xv. DRC (Disaster Recovery Centre)

The DRC will provide the facility to recover any system that fails within the PP- IC3 Centre by restoring the system from backup data, The training system will also be located at the DRC providing a backup control room in the event the PP- IC3 Centre becomes unusable or over whelmed.

xvi. JTMS (Journey Time Monitoring) System

The JTMS uses the information from the ANPR cameras to calculate the time taken for a vehicle to travel between two points in Lahore. This information is used to inform the citizens of Lahore as to areas of congestion, blocked roads and diversions that provide a quicker route.

xvii. RLMS (Red Light Monitoring System)

The RLMS uses information from the ANPR cameras and traffic signals to capture the number plates of vehicles which ignore red lights at traffic signals. The same system also monitors traffic flow to ensure that vehicles are using the correct lanes.

xviii. E - Challan Integration

The E Challan system has been integrated with the RLMS and ANPR systems to send out traffic offence notices so that offenders can pay their fines over the internet. There are also portable terminals that allow traffic

police officers to issue traffic offence notices for incorrect or no licenses and any other traffic offences that may have been committed.

xix. VMS (Variable Message System)

The VMS uses the data from the JTMS to inform drivers as to obstructions on the route ahead i.e. at the road side signs have been installed which display the appropriate message for the road it is installed upon.

xx. Specialist Vehicles

Specialist vehicles have been provided to for local command and control of events e.g. International Cricket matches or for major incidents e.g. Aircraft Crash

xxi. UAV (unmanned Aerial Vehicle)

UAVs provides support to the PP-IC3 Centre when the installed resources e.g. CCTV cameras do not have the coverage of the area where an incident is ongoing or when surveillance is required of a covert nature.

xxii. MDT (Mobile Data Terminals)

The MDT terminals provides a gateway for operational resources, deployed in a vehicle, to gain access to PP-IC3 system resources e.g. using the CAD system to identify a suspect.

Annexure - III

Integrated Operation Centres

PPIC3 has integrated the police command and control under one roof:

i. **Emergency Call Centre** (ECC) – ECC is handling all incoming and outgoing public demands

ii. **Dispatch Control Centre** (DCC) – DCC dispatches, monitor and supports operational resources

iii. **Video Monitoring Center** (VCC) – VCC proactively monitors the public spaces through an integrated CCTV infrastructure

iv. **Operations Monitoring Center** (OMC) – OMC monitors the location, patrol patterns and status of the police units

v. **Crisis Management Centre** (CMC) – CMC plans and manages all the pre-planned and spontaneous major events through a defined escalation process to contain and manage a situation or an event through a clearly defined command structure.

vi. **Media Monitoring Centre** (MMC) – MMC keeps an eye on electronic and social media as sources of information for responding to public needs. Keeping threats of terrorism in mind, social media is being monitored to check any suspicious and unlawful acts committed in cyber space.

vii. **Investigation and Intelligence Centre** (IIC) – IIC is responsible for assisting the investigation and intelligence branches of Police and other LEAs for collecting evidence captured through the city wide surveillance system and for presenting the evidence in the court of law.

viii. **Police Strategic Command** (PSC) – PSC is responsible for the strategic command of the Center

ix. **Police Traffic Management System** (PTMS) – PTMSis handling traffic related issues, violations and e-Challans

x. **Network Operations Control/Security Operations Center** (NOC/SOC) – NOC is responsible for monitoring and maintaining telecommunication network. SOC deals with security issues on an organizational and technical level

xi. **E-Investigation Center** (EIC)- EIC is handling investigation related database of the police investigators who can get all data from single window. There are hubs of this centre at various other locations for ease of access but also for data protection and privacy concerns.

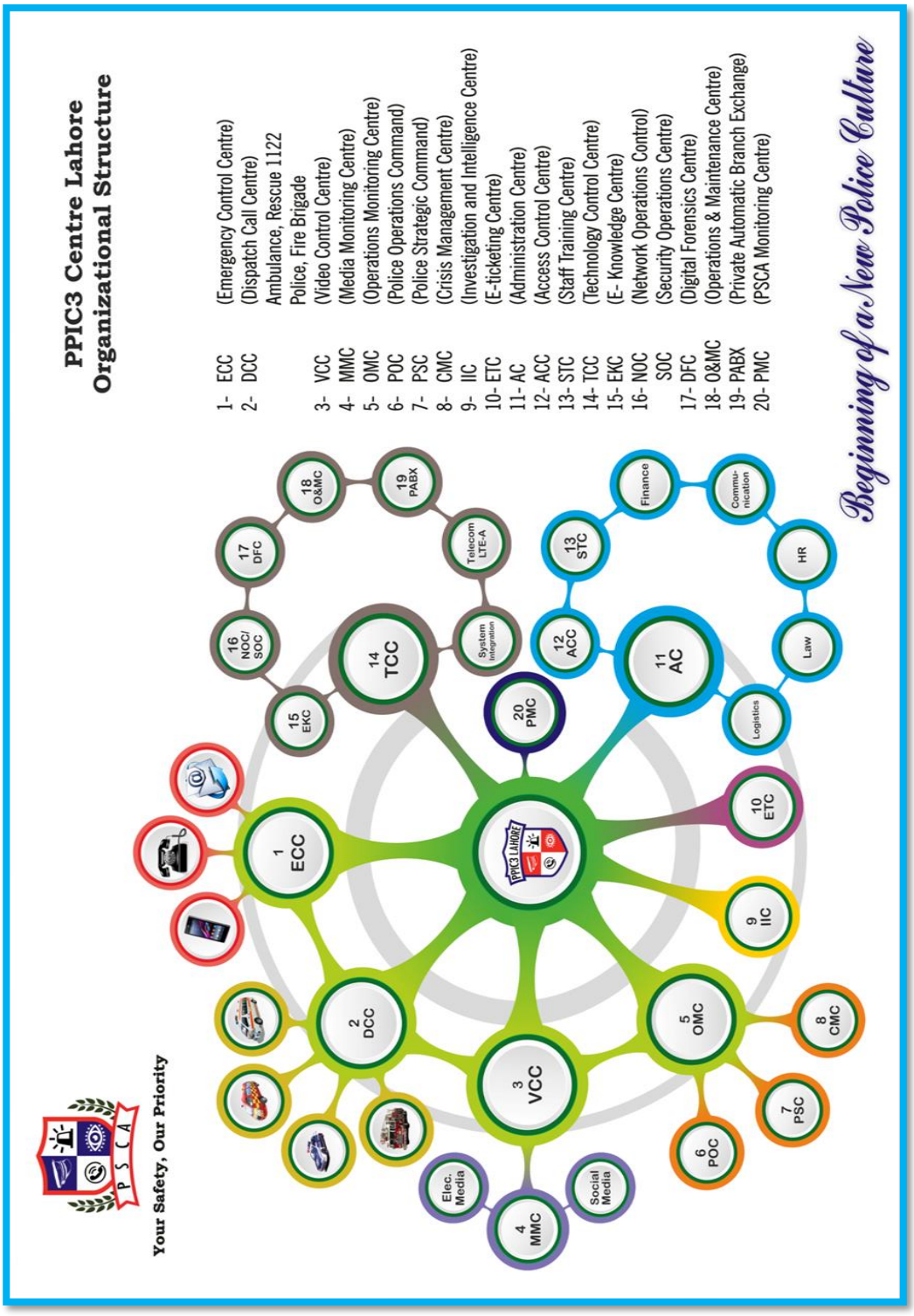
xii. **Access Control Center** (ACC) - ACC manages entry/exit into the PPIC3 Center premises, security system of the IT system

xiii. **Digital Media Forensics Center** (DFC) - DFC is responsible for manipulating and enhancing video of PPIC3 Center for evidentiary purposes

xiv. **Police Operational Command** (POC) –POC directs operations of the Center

xv. **Private Automatic Branch Exchange** (PABX) Center- is responsible for handling and operating fax/telephone etc.

PPIC3 Centre Lahore-Organizational Structure



Integrated Operations Centres

Annexure - IV

PIERS Lahore - 15

Here are details about number of calls received on Police Integrated Emergency Response System (PIERS) helpline number 15 in Lahore. It is important to mention that this data is not about registered criminal cases by the Police. Comparing the registered cases of each category on the basis of First Information Reports (FIRs) will not be adequate in that case. There is no real baseline for actual number of FIRs which can capture near to real estimates of crimes. However, it is possible to compare the number of calls about each category for successive years. There are also caveats in this case because it will take few years for people to trust the PIERS and report every crime through 15 emergency call systems.

This are a variety of reasons for not equating number of calls related to crimes with the registered crimes. Firstly, a lot of incidents of crimes do not get reported and even if reported, the cases are not registered in the Police stations (Watch, 2016). In that case, the onus is on the overall environment in which a victim and oppressors live. It is not easy to gain access to justice. Secondly, certain crimes are not considered reportable by a large majority of people due to cultural traditions and norms (Organization, 2009). For example, cases of domestic violence and rape often go unreported in our society (Huecker & Smock, 2019, 2019a; Women, 2019). Thirdly, police officers may also manipulate the data and show an unwillingness to record the reported crimes due to fear of their superiors (Programme, 2015; Watch, 2016). They tend to under report the actual number of crimes committed to mask their real performance regarding crime prevention. Fourthly, police officers lack proper knowledge about recording reported crimes under the right category. All these factors result in under-reporting of the actual number of crimes committed.

Total Calls received from 2017 to 2019 in Lahore-15ECC are 11,948,138; out of which only 23% are the valid calls. The cases which are dispatched to police stations for further necessary actions are 496,782. The figure above illustrates the details of dispatch cases among divisions of Lahore and also showing the monthly trend of crime in Lahore.

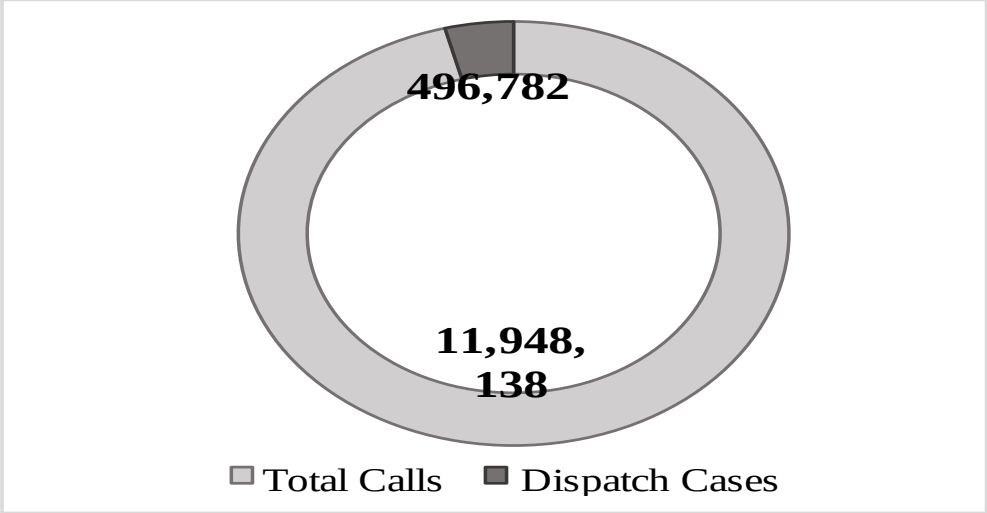


Figure Integrated Emergency Case Response Lahore-15

Data of last three years show an increase in Crime related calls and nature of the crime is also diverse. There is an extensive framework for crime classification. 'Public Order' includes the types of crime that interfere with the operations of society (Oxford, 2015). It includes street fight, assault on police, loudspeaker, neighborhood disputes, economical issue, drunken behavior etc. 'Crime against Property' usually involves private property to obtain money or other benefits. It includes theft, vehicle theft, robbery/snatching, fraud, burglary, vehicle snatching and dacoity (Williams, 2017). According to Black's Law Dictionary, Crime against property means 'a category of criminal offense in which the perpetrator seeks to derive an unlawful benefit from or do damage to another's property without the use or threat of force' (Bryan A. Garner). Crime against Person is defined as a 'category of criminal offences in which the perpetrator uses or threatens to use force examples including assault,

kidnapping etc' (Baryan A. Garner). Heinous crime is defined as '(of a crime or its perpetrator) shockingly atrocious or odious' (ibid). Traffic offence is defined here as 'a violation of traffic regulations' (Collins) under the applicable laws of the Punjab.

Figure of Nature of Cases, indicates that public order is the major category in Lahore that counts 420, other help counts 310, crime against property and person constitutes 272 and 229. Traffic offence is one of the major problems in urban areas of Lahore and consists of 144 dispatch cases.

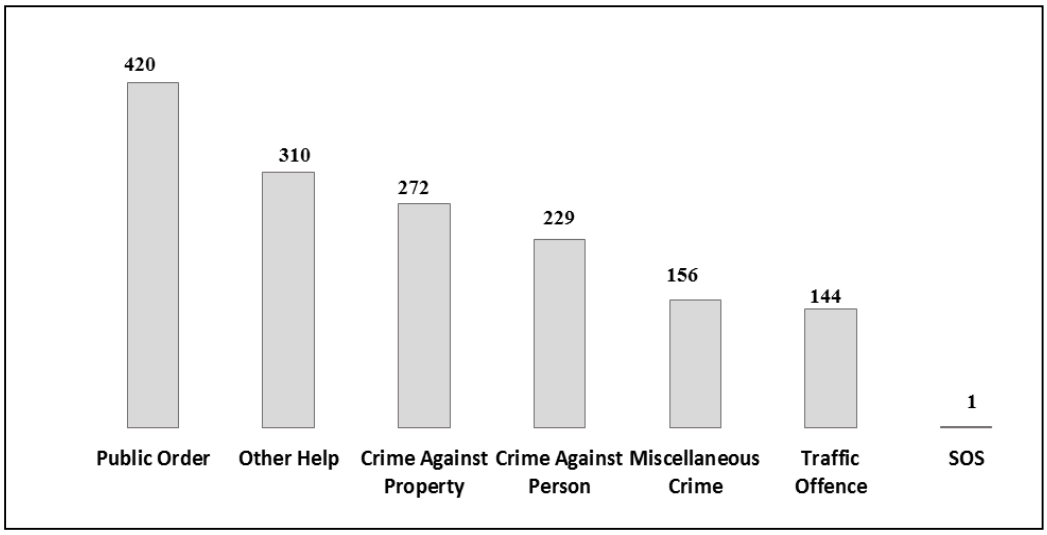
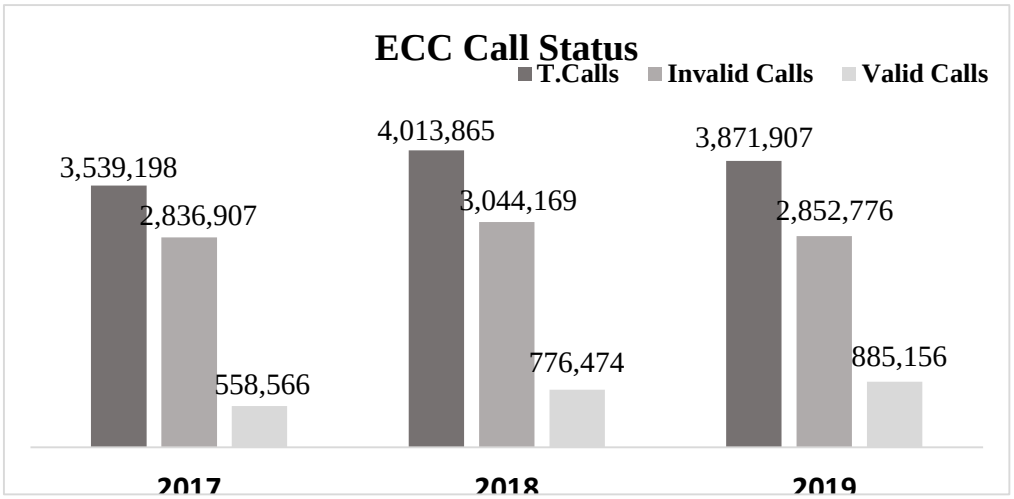


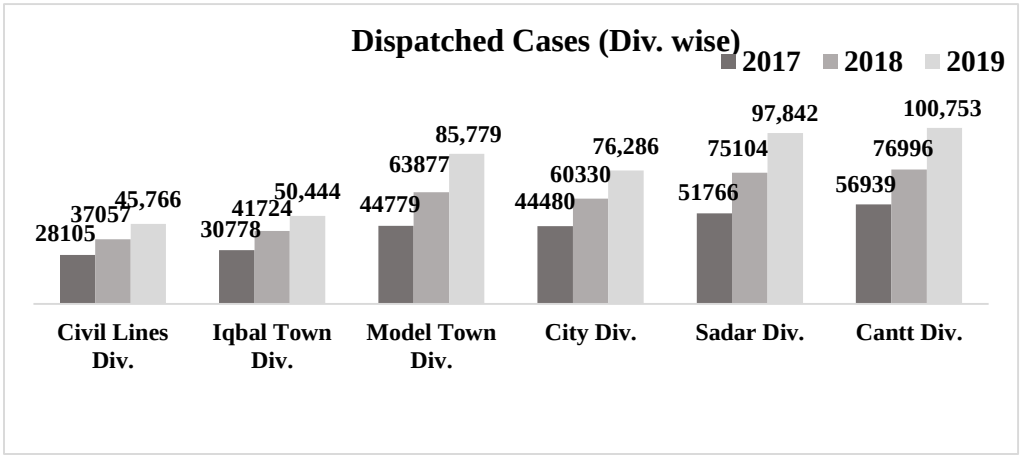
Figure. Nature of cases

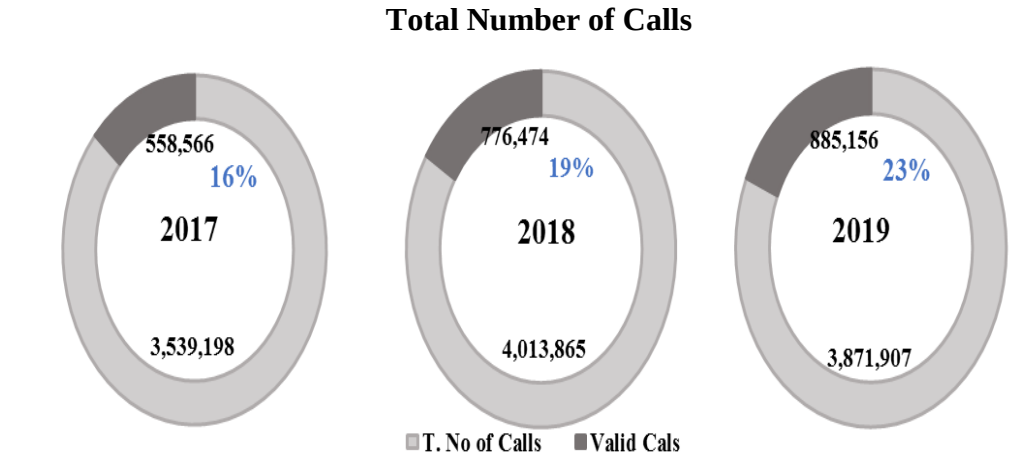
Annexure - V

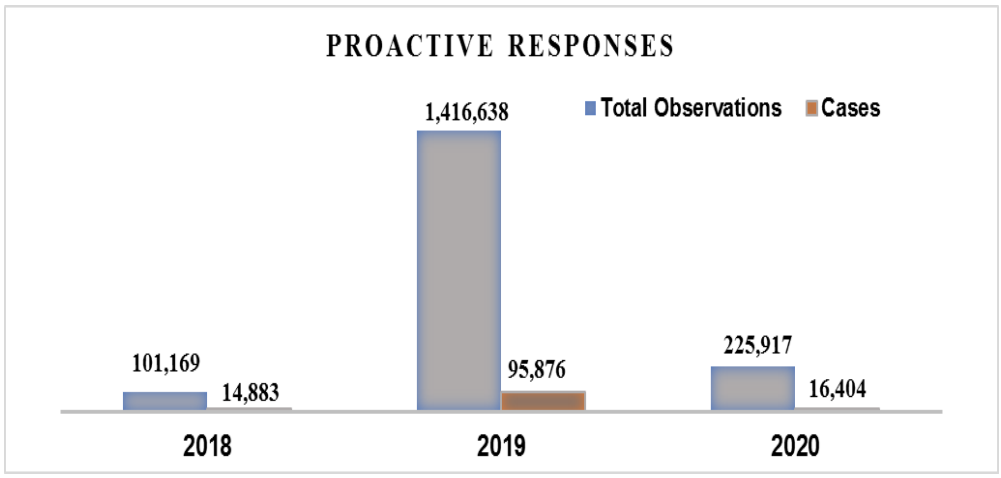
PIERS 15 - Temporal Analysis - 2017-2019

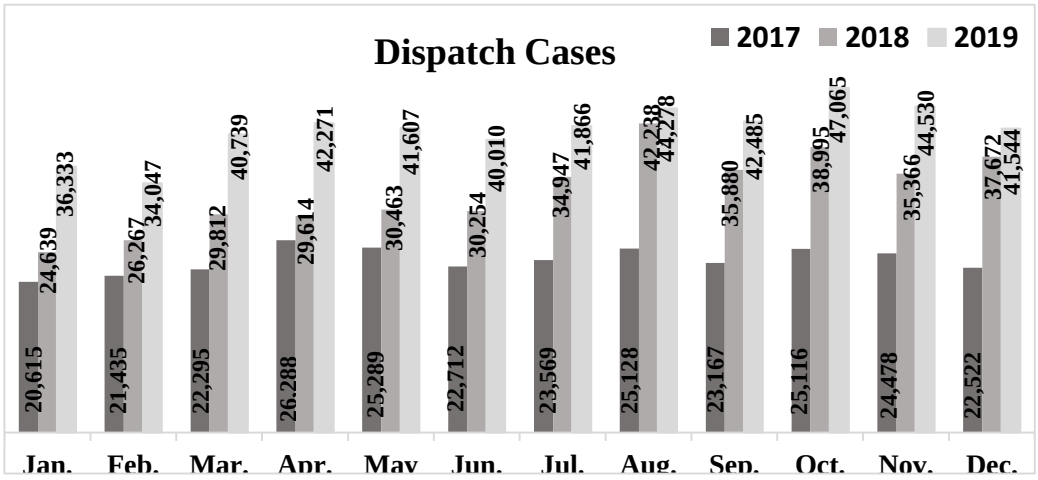
The project was started in 2016 and it was implemented from 2017 to 2019. Comparing the three datasets will show the impact of PPIC3 Programme on crime rates in different categories. Since the inception of the project, there is a trend of installing CCTV cameras all across the city by private parties in business centers as well as in residential areas. In the absence of any reliable data, it will not be possible to gauge the unintended consequences and effects of this project; however, it has set a trend in public and private sector to use technology for mass surveillance in urban areas.



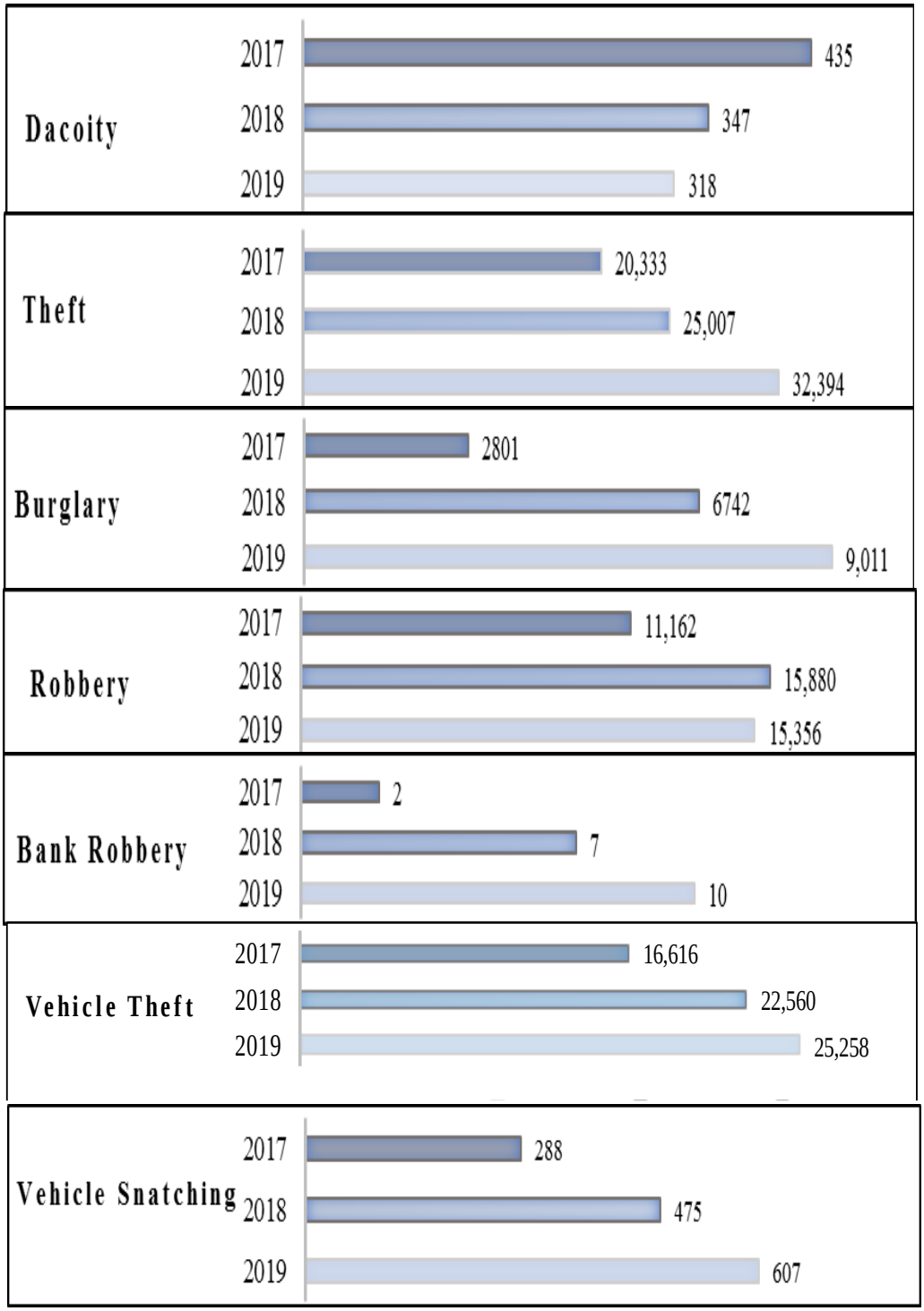



Total Number of Calls
558,566
16%
2017
3,539,198
776,474
19%
2018
4,013,865
885,156
23%
2019
3,871,907
T. No of Calls
Valid Cals

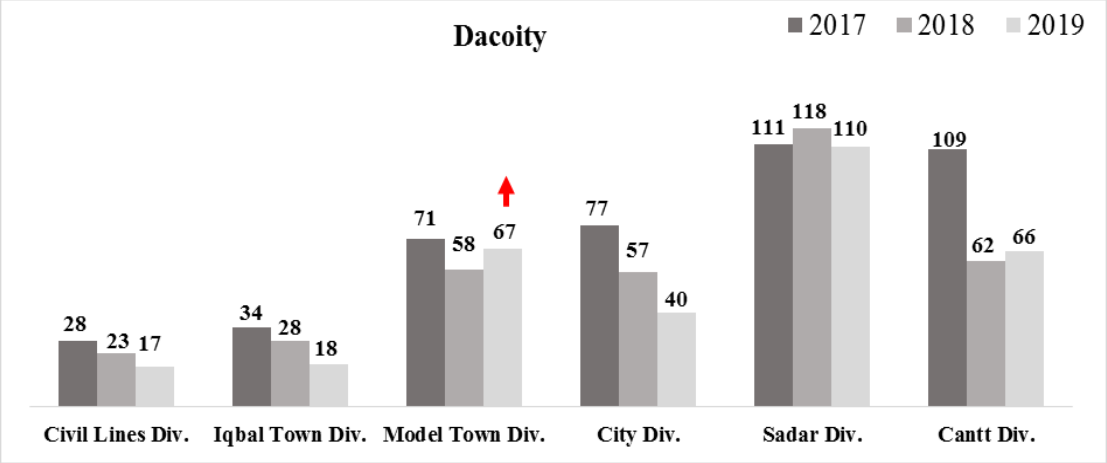

PROACTIVE RESPONSES
Total Observations
Cases
101,169
14,883
1,416,638
95,876
225,917
16,404
2018
2019
2020

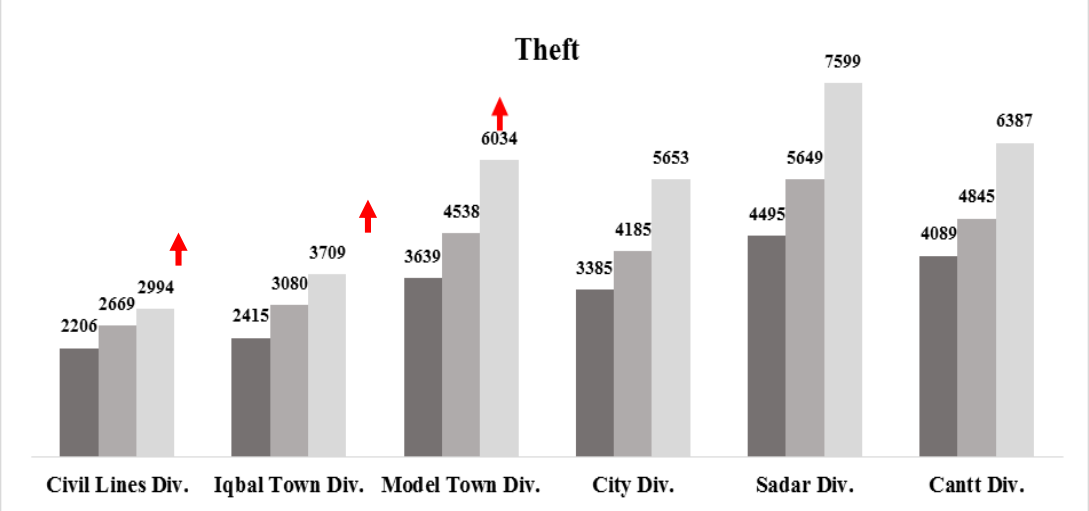

Dispatch Cases
2017
2018
2019
20,615
24,639
36,333
21,435
26,267
34,047
22,295
29,812
40,739
26,288
29,614
42,271
25,289
30,463
41,607
22,712
30,254
40,010
23,569
34,947
41,866
25,128
42,238
44,278
23,167
35,880
42,485
25,116
38,995
47,065
24,478
35,366
44,530
22,522
37,672
41,544
Jan.
Feb.
Mar.
Apr.
May
Jun.
Jul.
Aug.
Sep.
Oct.
Nov.
Dec.

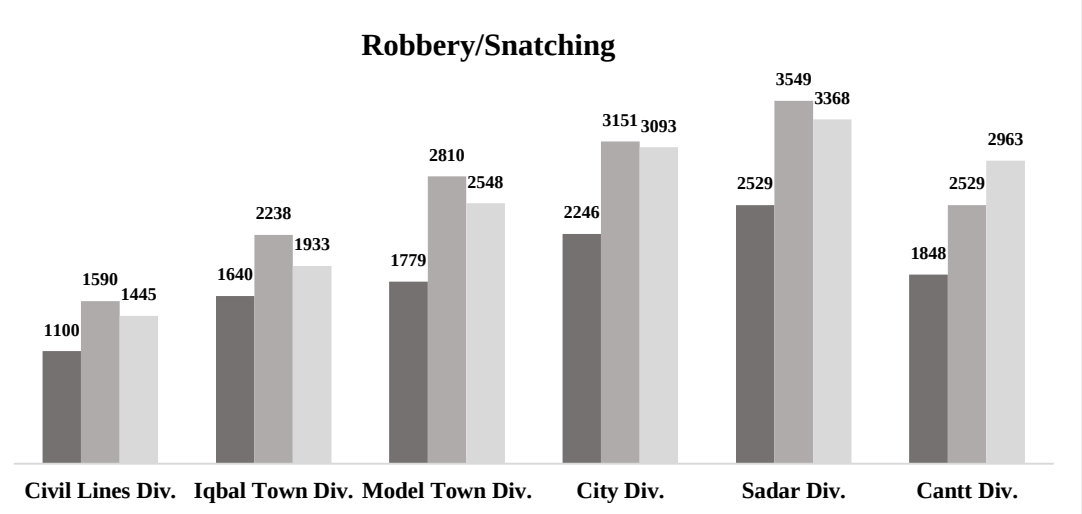
7 Categories of Heinous Crime

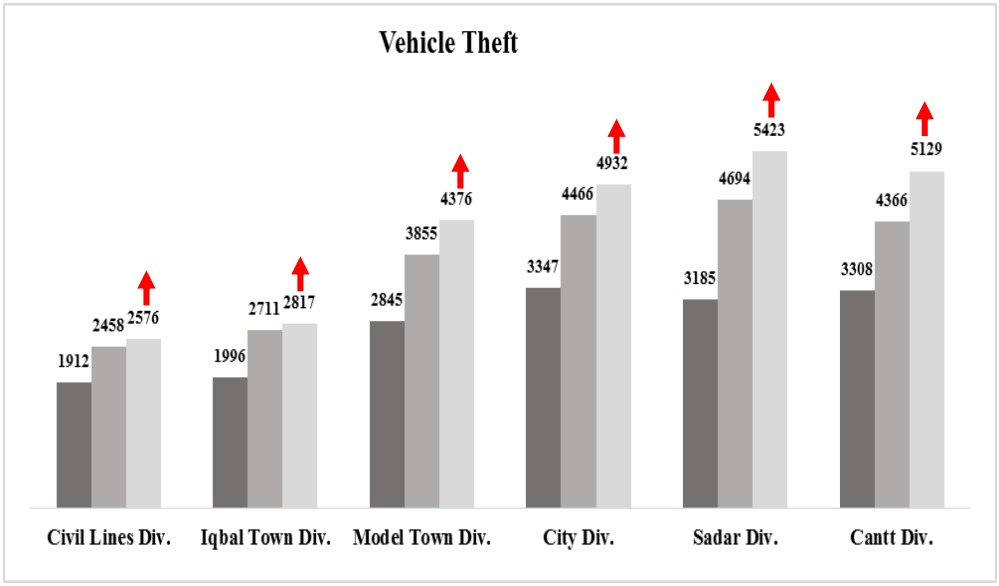


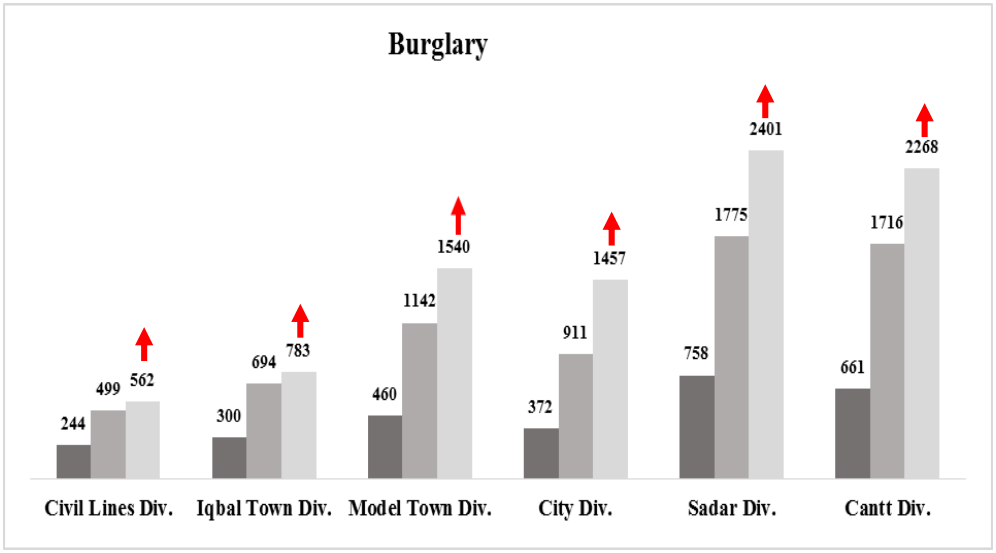
Divisional Analysis – Lahore 15

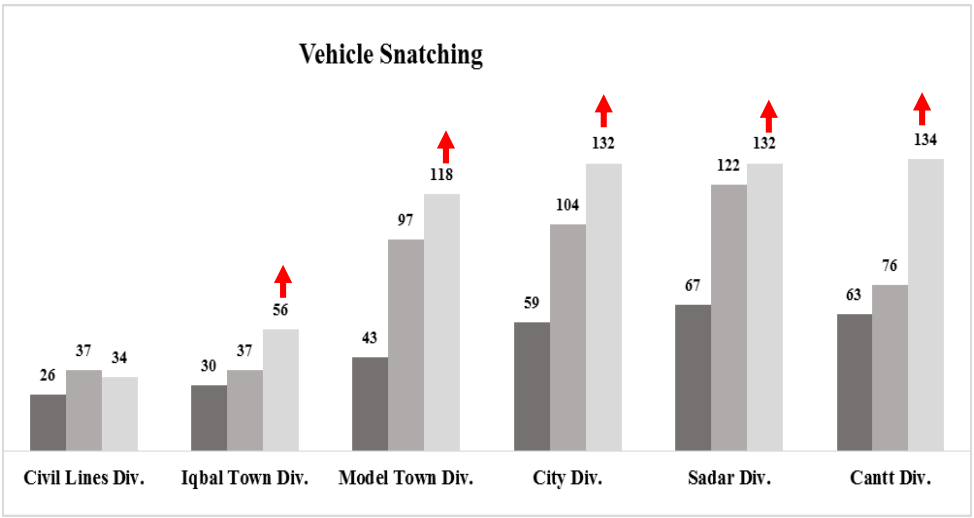







Vehicle Theft
1912
2458
2576
1996
2711
2817
2845
3855
4376
3347
4466
4932
3185
4694
5423
3308
4366
5129
Civil Lines Div.
Iqbal Town Div.
Model Town Div.
City Div.
Sadar Div.
Cantt Div.


Burglary
244
499
562
300
694
783
460
1142
1540
372
911
1457
758
1775
2401
661
1716
2268
Civil Lines Div.
Iqbal Town Div.
Model Town Div.
City Div.
Sadar Div.
Cantt Div.


Vehicle Snatching
26
37
34
30
37
56
43
97
118
59
104
132
67
122
132
63
76
134
Civil Lines Div.
Iqbal Town Div.
Model Town Div.
City Div.
Sadar Div.
Cantt Div.

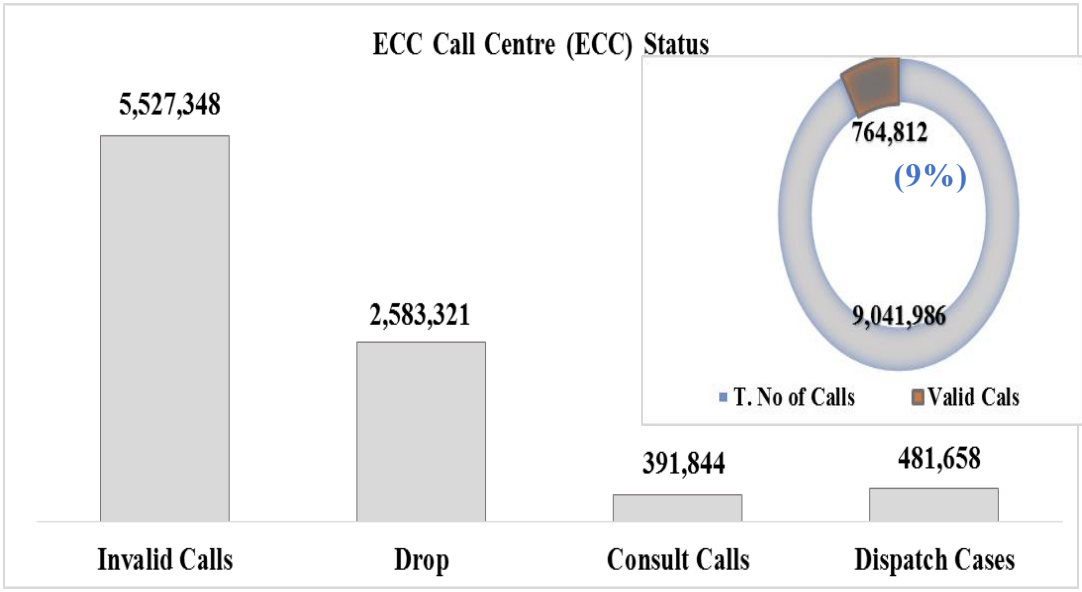
These figures may serve as a baseline to which the change in crime rates can be compared to after the implementation of the PPIC3 Programme. The same information will be recorded for subsequent years for comparison purpose. The systematic analysis of crime related calls received on emergency call number 15 is used for identifying and predicting risks to public safety. It is also used for efficient and targeted deployment of police resources. Crime incidents are random and non-random & take place in all areas of Lahore.

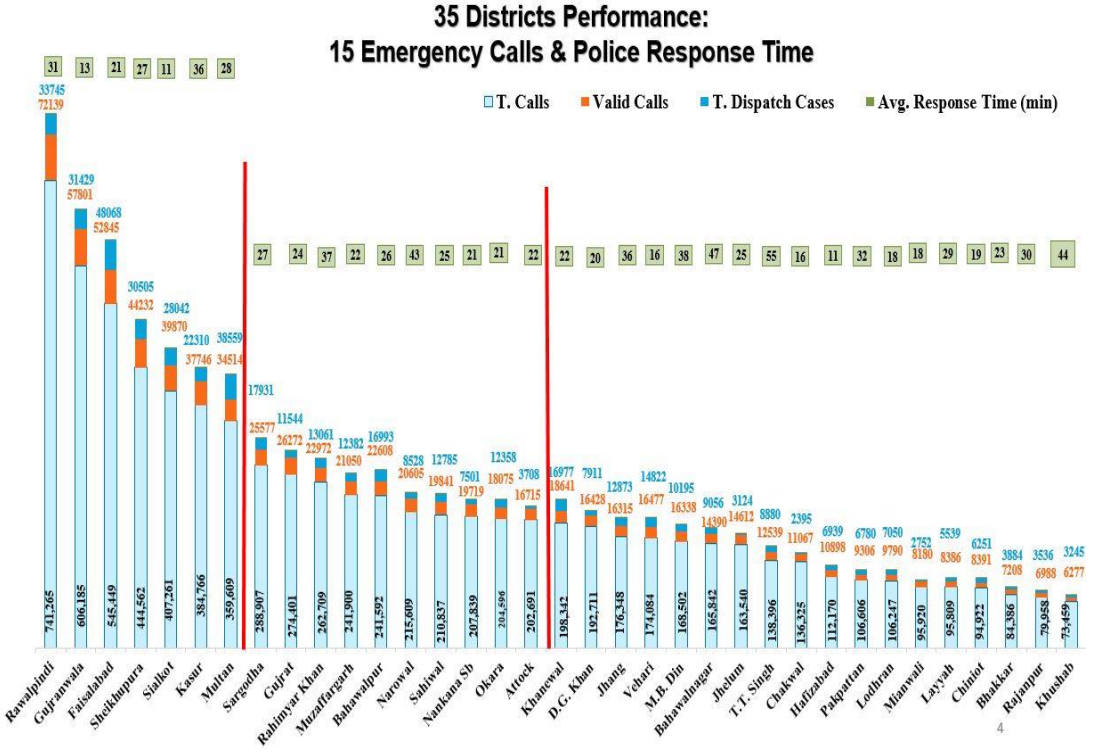
Annexure - VI

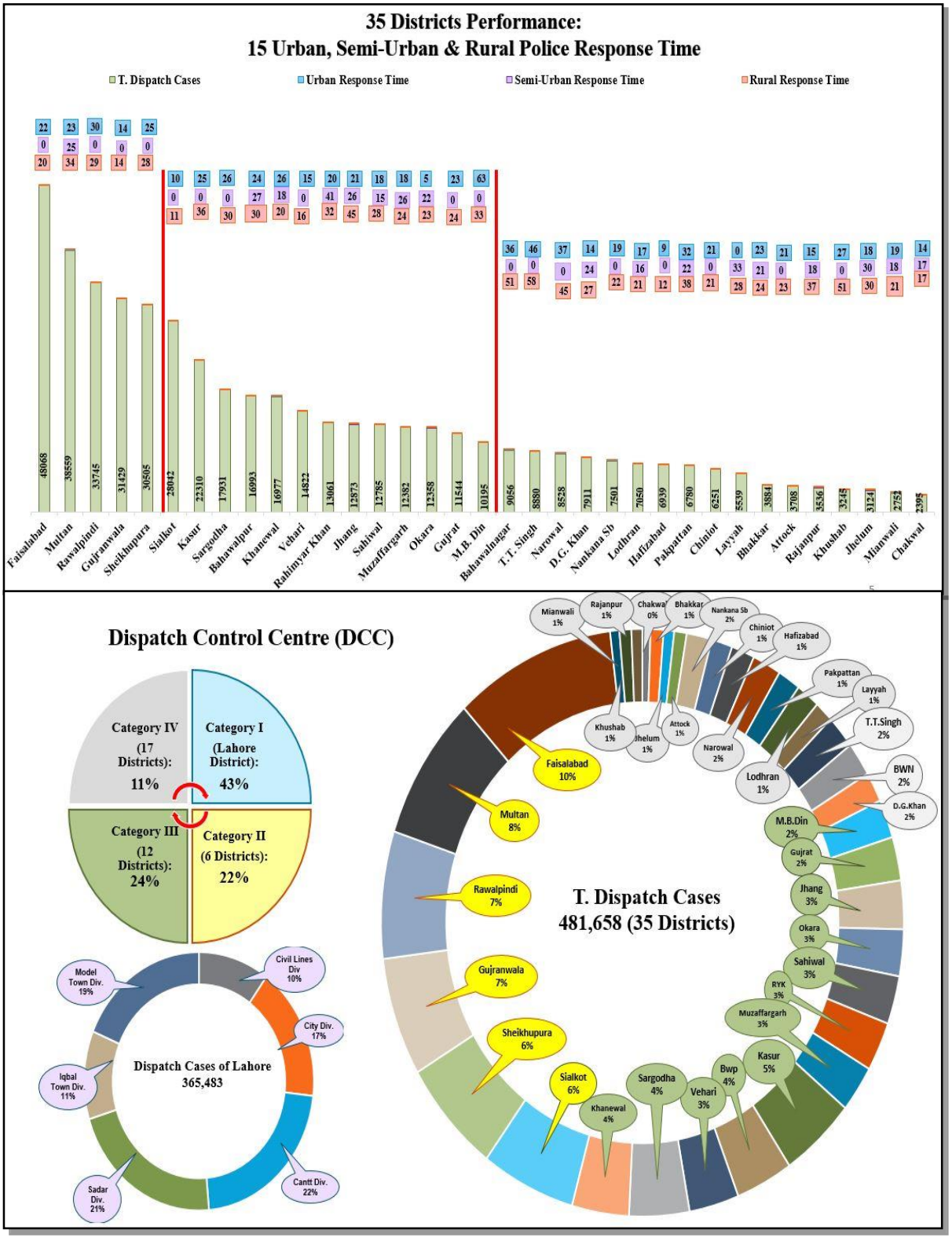
PUCAR-15 First Year Analysis Report

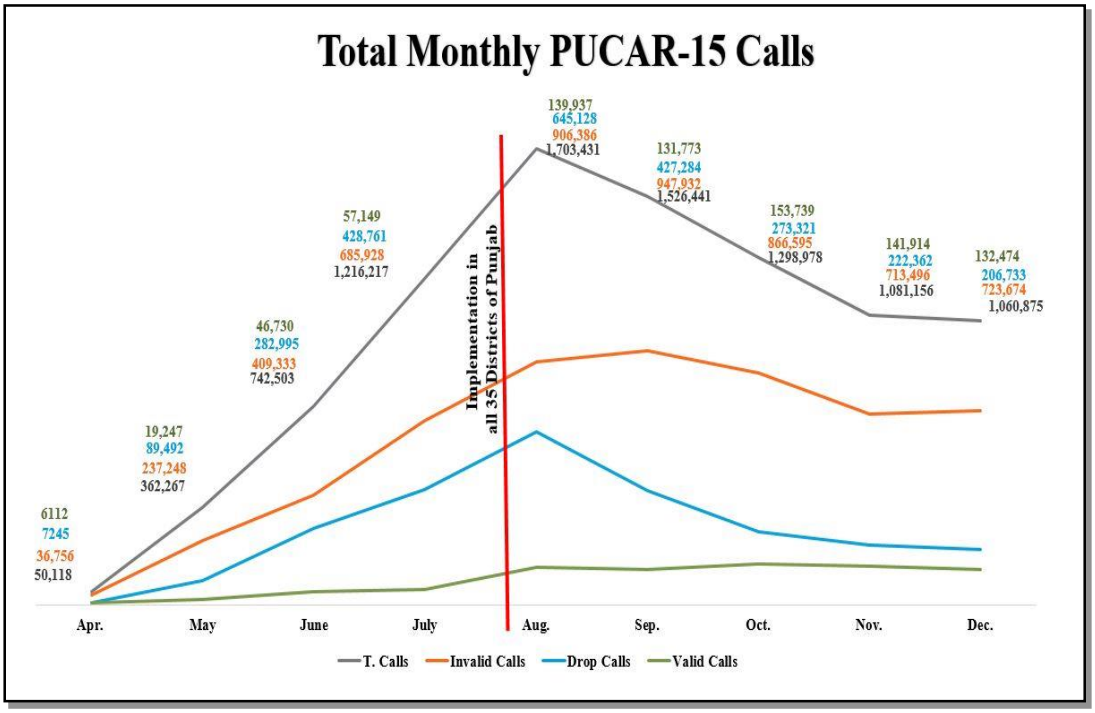
From 15th April 2019 to 31st Dec. 2019

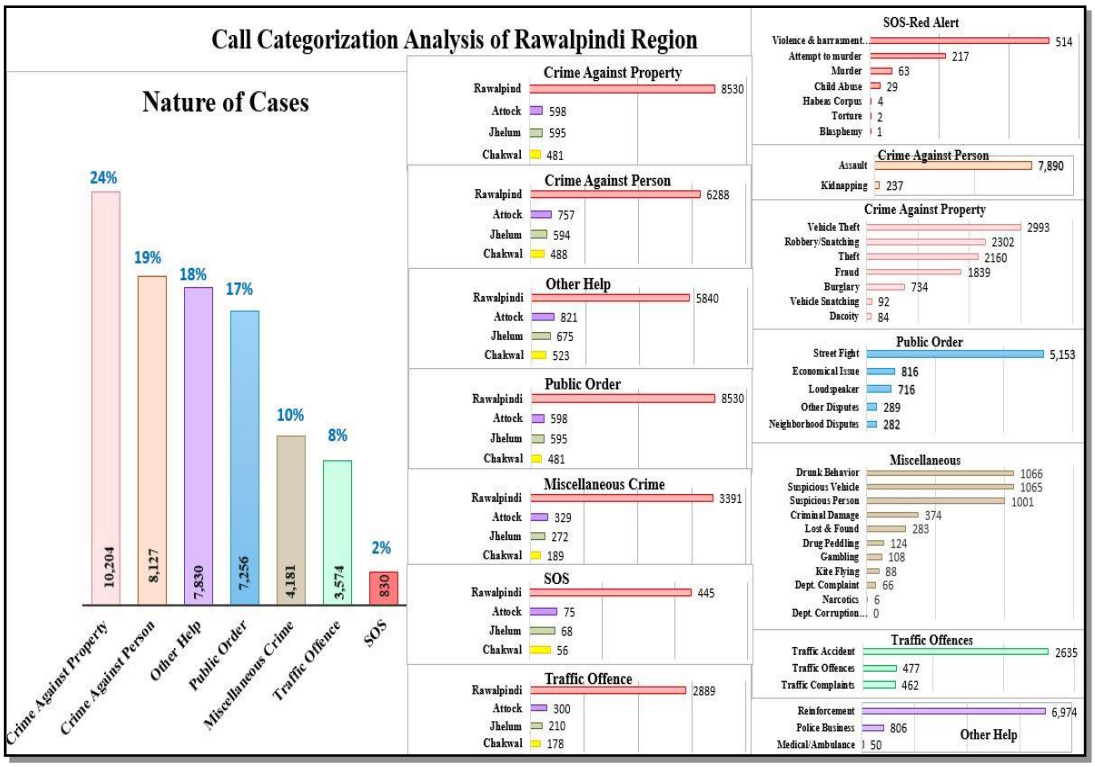
Details are described below.

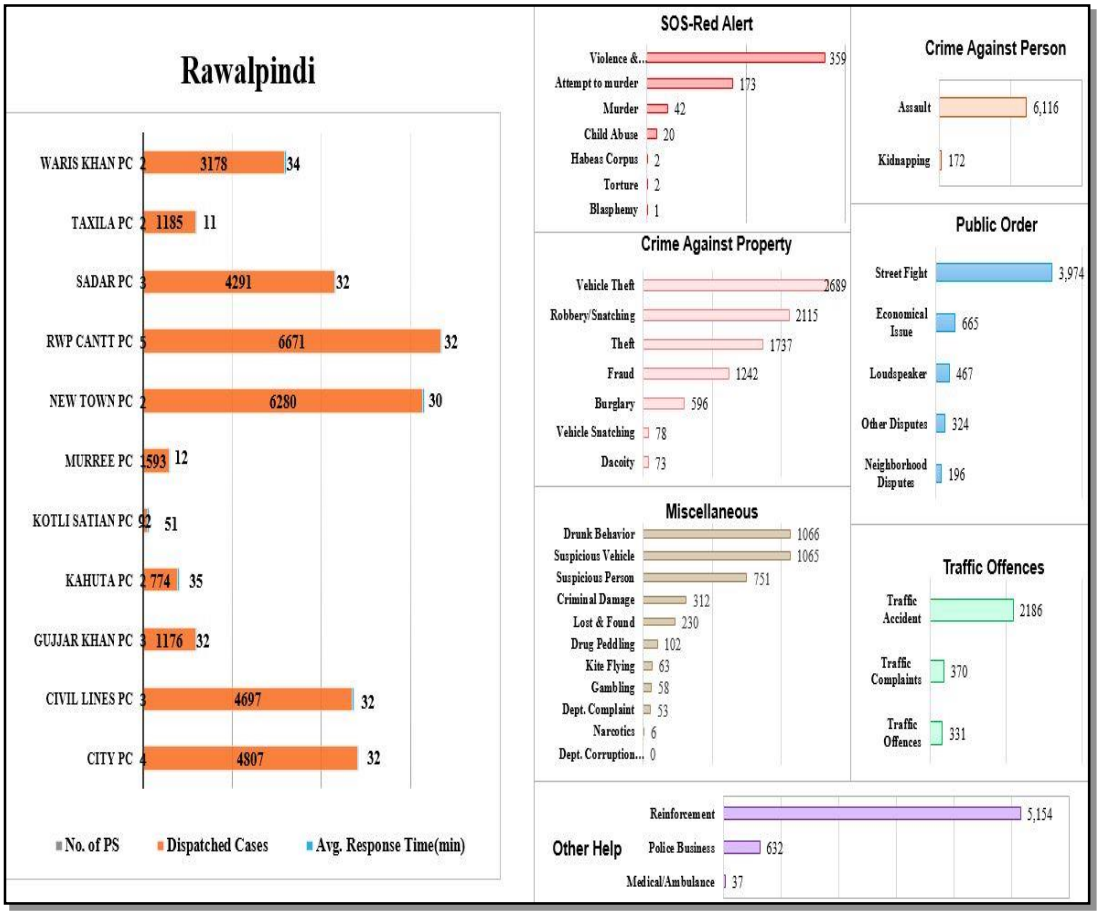





35 Districts Performance:
15 Urban, Semi-Urban & Rural Police Response Time
T. Dispatch Cases
Urban Response Time
Semi-Urban Response Time
Rural Response Time
Faisalabad
Multan
Rawalpindi
Gujranwala
Sheikhupura
Sialkot
Kasur
Sargodha
Bahawalpur
Khanewal
Vehari
Rahimyar Khan
Jhang
Sahiwal
Muzaffargarh
Okara
Gujrat
M.B. Din
Bahawalnagar
T.T. Singh
Narowal
D.G. Khan
Nankana Sb
Lodhran
Hafizabad
Pakpattan
Chiniot
Layyah
Bhakkar
Attock
Rajanpur
Khushab
Jhelum
Mianwali
Chakwal
Dispatch Control Centre (DCC)
Category IV (17 Districts): 11%
Category I (Lahore District): 43%
Category III (12 Districts): 24%
Category II (6 Districts): 22%
Dispatch Cases of Lahore 365,483
Model Town Div. 19%
Civil Lines Div 10%
City Div. 17%
Iqbal Town Div. 11%
Sadar Div. 21%
Cantt Div. 22%
T. Dispatch Cases 481,658 (35 Districts)
Faisalabad 10%
Multan 8%
Rawalpindi 7%
Gujranwala 7%
Sheikhupura 6%
Sialkot 6%
Khanewal 4%
Sargodha 4%
Vehari 3%
Bwp 4%
Kasur 5%
Muzaffargarh 3%
RYK 3%
Sahiwal 3%
Okara 3%
Jhang 3%
Gujrat 2%
M.B.Din 2%
D.G.Khan 2%
BWN 2%
T.T.Singh 2%
Lodhran 1%
Narowal 2%
Attock 1%
Jhelum 1%
Khushab 1%
Mianwali 1%
Rajanpur 1%
Chakwal 0%
Bhakkar 1%
Nankana Sb 2%
Chiniot 1%
Hafizabad 1%
Pakpattan 1%
Layyah 1%


Total Monthly PUCAR-15 Calls
Implementation in all 35 Districts of Punjab
6112
7245
36,756
50,118
19,247
89,492
237,248
362,267
46,730
282,995
409,333
742,503
57,149
428,761
685,928
1,216,217
139,937
645,128
906,386
1,703,431
131,773
427,284
947,932
1,526,441
153,739
273,321
866,595
1,298,978
141,914
222,362
713,496
1,081,156
132,474
206,733
723,674
1,060,875
Apr.
May
June
July
Aug.
Sep.
Oct.
Nov.
Dec.
T. Calls
Invalid Calls
Drop Calls
Valid Calls


Call Categorization Analysis of Rawalpindi Region
Nature of Cases
24%
19%
18%
17%
10%
8%
2%
10,204
8,127
7,830
7,256
4,181
3,574
830
Crime Against Property
Crime Against Person
Other Help
Public Order
Miscellaneous Crime
Traffic Offence
SOS
Crime Against Property
Rawalpind 8530
Attock 598
Jhelum 595
Chakwal 481
Crime Against Person
Rawalpind 6288
Attock 757
Jhelum 594
Chakwal 488
Other Help
Rawalpindi 5840
Attock 821
Jhelum 675
Chakwal 523
Public Order
Rawalpindi 8530
Attock 598
Jhelum 595
Chakwal 481
Miscellaneous Crime
Rawalpindi 3391
Attock 329
Jhelum 272
Chakwal 189
SOS
Rawalpindi 445
Attock 75
Jhelum 68
Chakwal 56
Traffic Offence
Rawalpindi 2889
Attock 300
Jhelum 210
Chakwal 178
SOS-Red Alert
Violence & harrasment.. 514
Attempt to murder 217
Murder 63
Child Abuse 29
Habeas Corpus 4
Torture 2
Blasphemy 1
Crime Against Person
Assault 7,890
Kidnapping 237
Crime Against Property
Vehicle Theft 2993
Robbery/Snatching 2302
Theft 2160
Fraud 1839
Burglary 734
Vehicle Snatching 92
Dacoity 84
Public Order
Street Fight 5,153
Economical Issue 816
Loudspeaker 716
Other Disputes 289
Neighborhood Disputes 282
Miscellaneous
Drunk Behavior 1066
Suspicious Vehicle 1065
Suspicious Person 1001
Criminal Damage 374
Lost & Found 283
Drug Peddling 124
Gambling 108
Kite Flying 88
Dept. Complaint 66
Narcotics 6
Dept. Corruption... 0
Traffic Offences
Traffic Accident 2635
Traffic Offences 477
Traffic Complaints 462
Other Help
Reinforcement 6,974
Police Business 806
Medical/Ambulance 50



PUCAR-15 is revamping police culture by providing detailed crime analysis and helping Police to mitigate the public safety risks related to crime and traffic management. Currently PIERS is receiving around 45,000 calls per day and out of them 85 - 90% are prank or invalid calls and 5-10% are the relevant cases for help and info. Every time when someone makes an invalid call, it puts someone else's life in danger; for whom this call is a matter of life and death. So, public citizens are requested to use this portal for public services not to create hindrance in providing true services to the public.

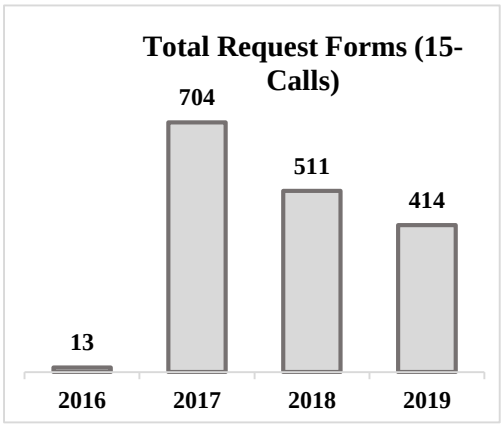
PUCAR-15 is a practical methodology in policing that truly speaks the need of services to be provided by police to the public citizens at grass-root level. It helps in focusing at major crime categories to mitigate them and bring peace & harmony within the region.

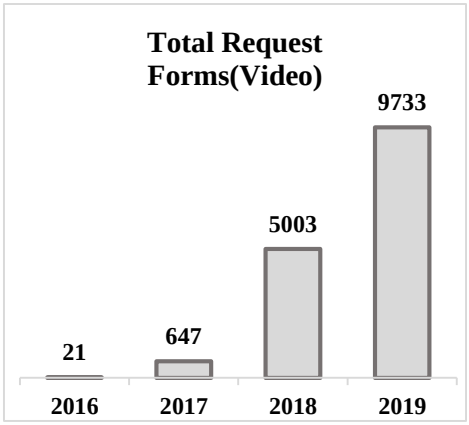
	S. No.	Police Station	Police Circle	U/R	Dispatch Cases	Avg. Response Time	Criminal Offence	Other Help	Public Order	Traffic Offence
Rawalpindi	1	City Rawalpindi	City	Urban	1732	29	866	316	334	199
	2	Gunjmandi		Urban	554	34	300	115	101	32
	3	Pirwadhai		Urban	1828	33	962	316	363	167
	4	Reta Amral		Urban	692	35	393	111	142	34
	5	Airport	Civil Lines	Urban	2372	33	1319	444	372	196
	6	Civil Lines		Urban	1509	32	772	282	249	185
	7	Morgah		Urban	815	28	417	143	125	115
	8	Women		Urban	0	0	0	0	0	0
	9	Gujar Khan	Gujjar Khan	Rural	630	27	310	135	122	50
	10	Jatli		Rural	240	33	138	45	45	8
	11	Mandra		Rural	306	42	158	52	55	37
	12	Kahuta	Kahuta	Rural	387	33	204	73	61	36
	13	Kallar Syedan		Rural	387	36	210	73	74	24
	14	Kotli Sattian	Kotli Sattian	Rural	92	51	49	23	12	7
	15	Murree	Murree	Rural	593	12	256	112	106	113
	16	New Town	New Town	Urban	2787	32	1562	490	437	283
	17	Sadiqabad		Urban	3492	30	2067	551	603	227
	18	Cantt	Rawalpindi Cantt	Urban	1160	37	610	180	210	157
	19	Naseerabad		Urban	1981	29	1159	321	344	130
	20	R.A. Bazar		Urban	1006	30	542	191	183	76
	21	Race Course		Urban	1542	32	897	260	280	84
	22	Westrdige		Urban	982	31	533	168	168	104
	23	Chountra	Sadar	Rural	453	43	301	70	51	26
	24	Rawat		Rural	1216	25	662	193	195	152
	25	Sadar Beruni		Rural	2622	34	1606	400	428	146
	26	Sadar Wah Cantt	Taxila	Rural	348	18	175	74	60	35
	27	Taxila		Rural	469	8	233	104	78	47
	28	Wah Cantt		Rural	368	9	182	74	77	28
	29	Banni	Waris Khan	Urban	1162	31	685	188	231	43
	30	Waris Khan		Urban	2015	36	1096	334	398	148

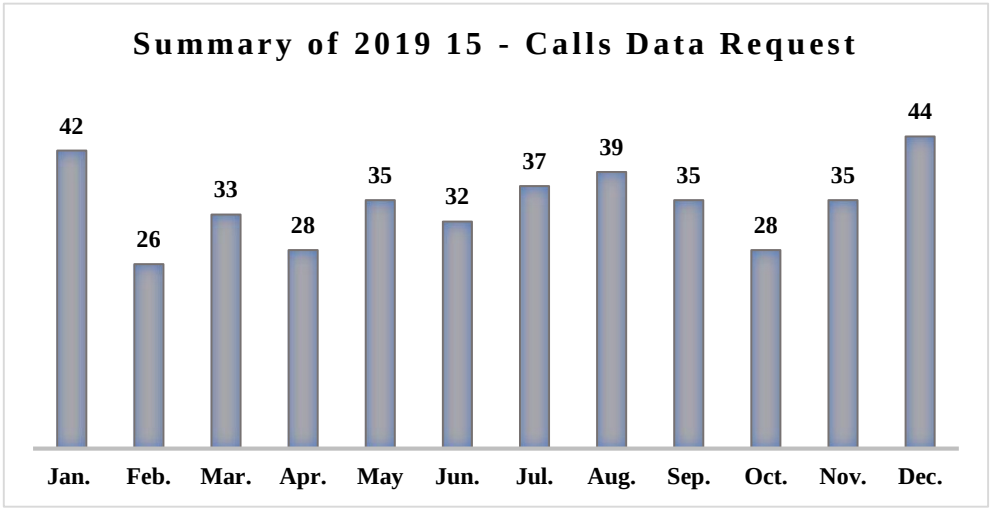
The above figure of Rawalpindi, as an example, shows that data is provided to the police station level to analyse the types of calls related to crime so Police can design crime combating strategies as well as to monitor performance of police officers.

Annexure - VII

Electronic Data Analysis Center (EDAC)

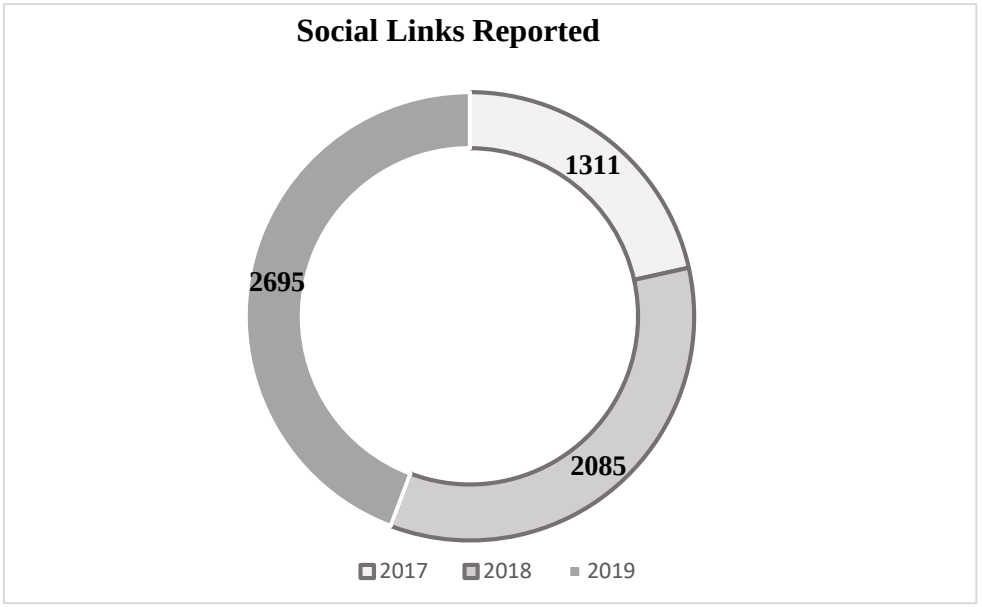


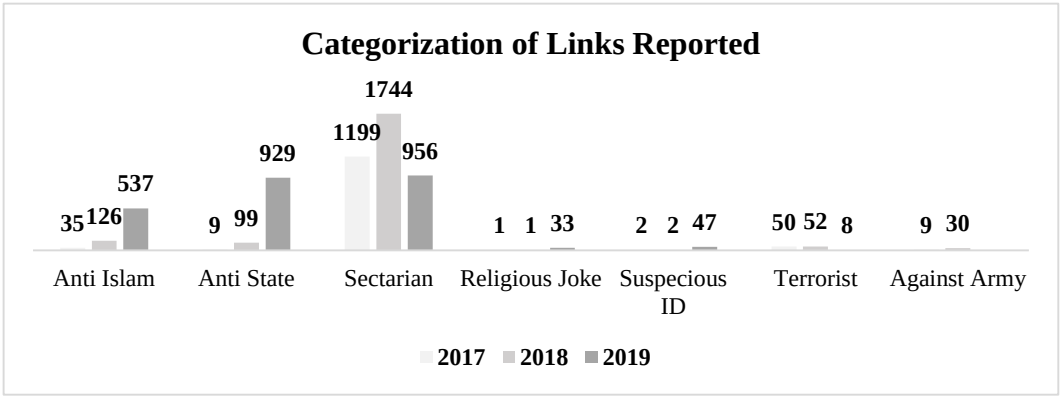


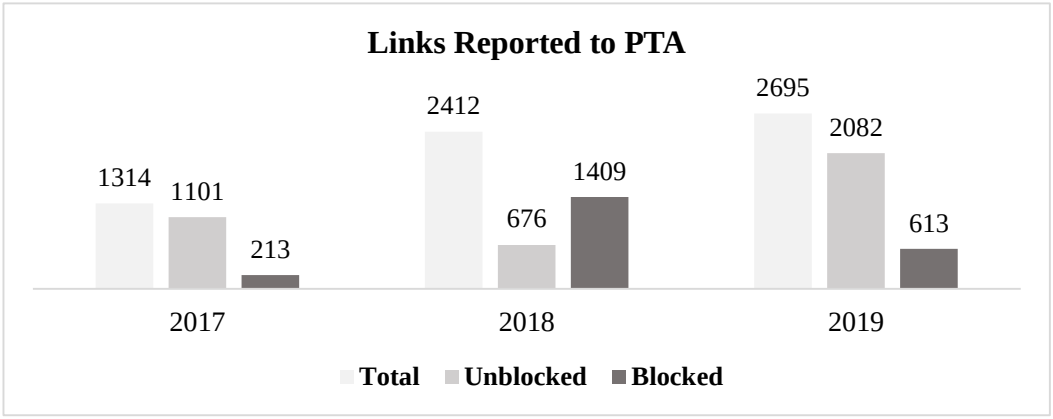


Annexure - VIII

Media Monitoring Centre

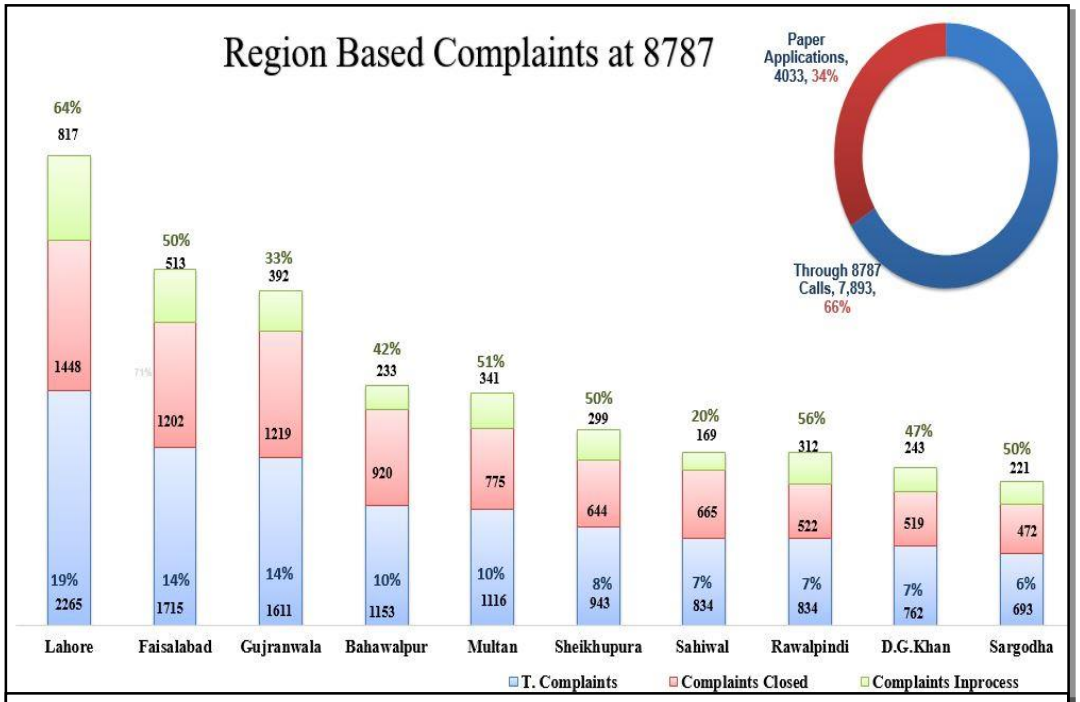


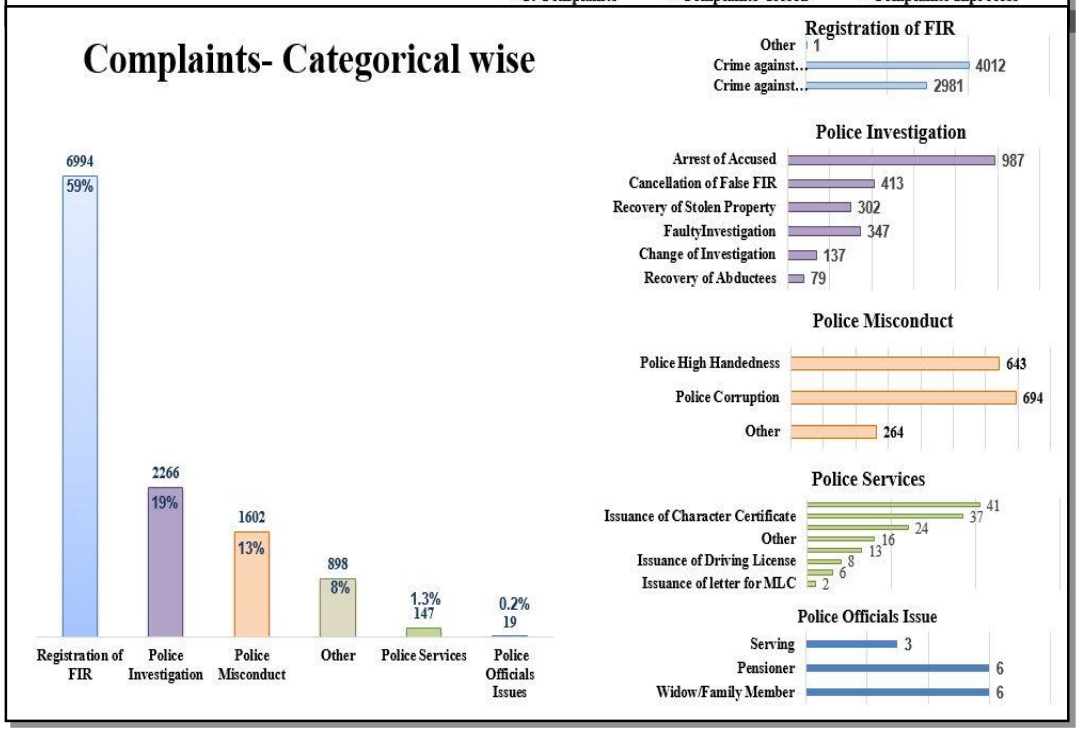


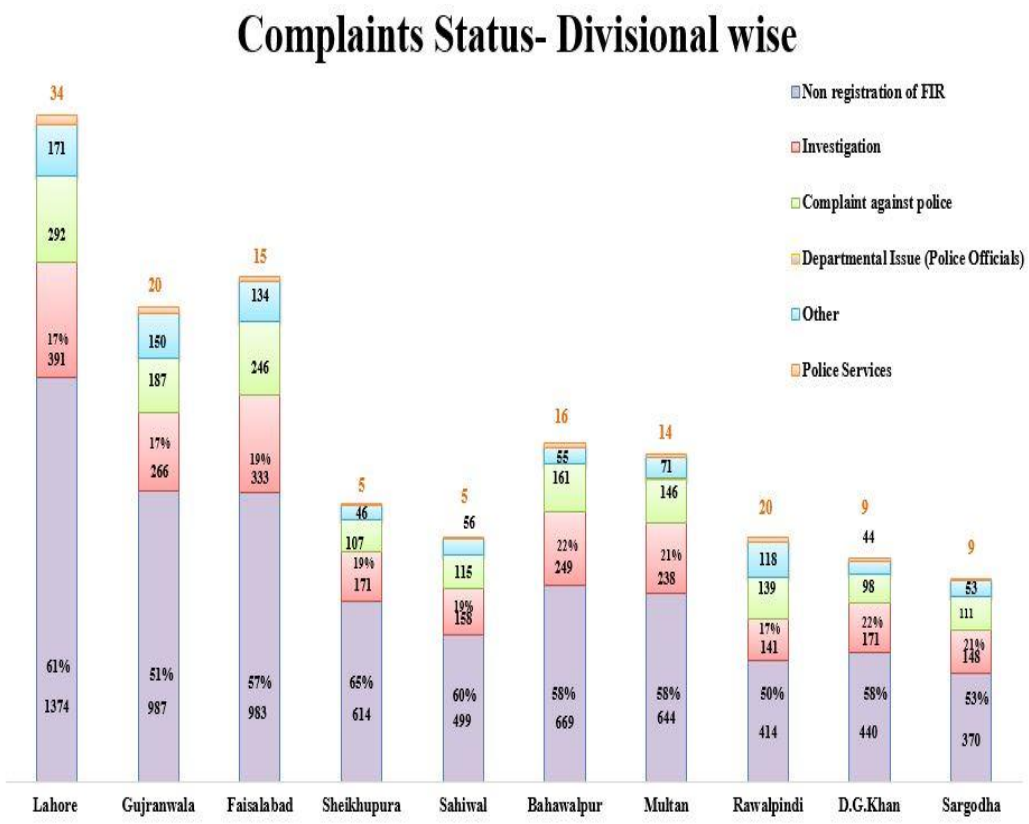


Annexure - IX

8787 Analysis Report






Complaints Status- Divisional wise
Non registration of FIR
Investigation
Complaint against police
Departmental Issue (Police Officials)
Other
Police Services
Lahore
34
171
292
17%
391
61%
1374
Gujranwala
20
150
187
17%
266
51%
987
Faisalabad
15
134
246
19%
333
57%
983
Sheikhupura
5
46
107
19%
171
65%
614
Sahiwal
5
56
115
19%
158
60%
499
Bahawalpur
16
55
161
22%
249
58%
669
Multan
14
71
146
21%
238
58%
644
Rawalpindi
20
118
139
17%
141
50%
414
D.G.Khan
9
44
98
22%
171
58%
440
Sargodha
9
53
111
21%
148
53%
370

Annexure - X

PSCA Training and Capacity Building Centre

Focus on human resource training and capacity building is key requirement for developing a team for change management. In this case all aspects of human resource management were addressed. It was an interesting model and Lahore University of Management and Sciences (LUMS) took it as a case study for their students. To motivate the team, a useful reward and punishment system with monetary and non-monetary incentives was designed and implemented.

Table 11 Police Communication Officers Training

1.	Induction Training	2 Weeks
2.	Life-skills Training	2 Weeks
3.	Technical Training	4 Weeks
4.	Police Operations Training	2 weeks

It was not enough to impart trainings to internal team members. The new ways of evidence collection, analysis and presentation were equally important for other stakeholders of criminal justice system. Training sessions were regularly arranged for lawyers, prosecutors, investigators and even judges were provided with sufficient training and awareness about the electronic evidence collection and sharing procedures (Authority, 2019; A. N. Khan, 2019). These Electronic Data Analysis Regulations 2016 are first of its kind in Pakistan. Courts of law and experts have accepted them as per international standards and a valuable addition in the legal edifice of the country.

Lahore Police officials were the main target of trainings on multiple systems and processes. More than 5000 officers were trained to adapt the new telecommunication system in addition to multiple applications and business flows. Emergency response mechanisms were revised and first responders of

Police were developed from scratch. It was altogether a new concept for Police in Pakistan but they acquired new procedures and processes without much difficulty. In order to cater to the training requirements of selected PCOs, following training modules were conducted prior to their manning in PPIC3 Centre:

Table 12 In-House Training Sessions 2019

Sr. No	Training	Trainer	Designation	PSCA Staff trained
1	First Aid/Basic Life Support	Rescue 1122 Trainers	Training Resource Person	20
2	8787 Red Alerts in PUCKAR-15 Application Training of Police Communication Officers being attached at Emergency Call Centre (ECC)	Mr. Khalil Afzal Ms. Nida Latif	AM Data Base PPIC3 DEO (Software & QA)	81
3	Fire Fighting& Safety	Rescue 1122 Trainers	Training Resource Person	81

Table 13 Training of other Departments

Sr. No	Training Programme	Trainees	No. of Participants	Month
1	Training on LTE-A Handsets	Traffic Wardens , Rescue Emergency Services 1122,and Police Special Branch	214	Jan-Dec 2019
2	Surveillance through CCTV	Intelligence Bureau Officials	8	February ,2019
3	Divisional SPs and DSPs of 6 Police Divisions in Lahore	Punjab Police Officials	52	July 2019
4	Training on FR Application	Dolphin	1564	July- Sep 2019
5	Training on FR Application	PRU Teams	512	Sep-Oct 2019
6	PRU-PUCKAR Android Application Training	All RPOs& DPOs Staff	96 Master Trainers	Sep-2019
7	CCTV Operators of DPO Rahim Yar Khan Training on Surveillance	CCTV Operators of DPO office	7	Oct-2019
8	Basic Corporals Training ,Phase II , 2019 at Elite Police	Corporals of CTD	300	9 October, 2019

	Training School, Lahore			
9	Electronic Data Centre (EDC)web portal Training	ALL RPOs& DPOs staff Investigation Officers of District Lahore	120 Master Trainer across Punjab More than 600 IOs at Lahore	Oct-Nov 2019
10	ASPs of 45th STP attachment for 3 days from National Police Academy, Islamabad	ASPs	20 ASPs	February 2019

Annexure - XI

Software Development at PSCA

Technical Achievements – 35 Applications and Systems			
S.#	**Project Name**	**External Department**	**Year**
1	E-challan Management System	Excise, Post Office, ETC Traffic Police, Web Portal for Public	2019
2	Zindagi App	Ministry of Narcotics Islamabad	2019
3	Fleet Management System	Internal	2019
4	HRMS-TELE	DIG Telecom	2019
5	Dispatch system	Internal	2019
6	Public Safety App iOS and Android	Public	2019
7	Women Safety App iOS and Android	Public	2019
8	LE Park Android App	Lahore Parking Authority	2019
9	Change Request Management System	PSCA	2019
10	Performance Management System (Control Room Operations)	PSCA	2019
11	Asset Management System (TELE)	DIG Telecom	2019
12	Asset Management System (CPO)	CPO Office	2019
13	Asset Management System (SPU)	Special Protection Unit	2019
14	PSCA Website	PSCA	2019
15	PUCAR-15 System	Police Dolphin ,PRU, Operations	2019

16	Electronic Data Center (EDC) Web Portal	Police Investigation	2019
17	Media Monitoring Centre Analytics Software	Police Investigation	2019
18	PRU App integrated with PUCAR-15	Mobile Police response Unit	2019
19	Facial Recognition System	Criminal Record Office, Police Investigations and Operations	2019
20	8787 Police Complaint Cell System	Punjab Police	2019
21	KPK Excise MIS	KPK Excise	2019
22	GIS System	Internal, Mobile Police Response Unit	2019
23	PSCA Recruitment Portal	General Public	2019
24	Lahore Smart Cities Matrix	General Public	2019
25	Crime Cause Heat Analysis	Punjab Police	2019
26	GIS Based Route Planning System	PSCA	2019
27	GIS Based Optical Fiber Layout Planning System	PSCA	2019
28	HRMIS	PSCA	2018
29	MDT Challan Android App	PSCA	2018
30	E Challan Status Android App	Excise, Post Office, ETC Traffic Police, Web Portal for Public	2018

31	Asset Management System	Internal	2018
32	Finance Management System	Internal	2018
33	Lost & Found Management System	Police Operations and Investigation	2018

Annexure - XII

PPIC3 Project Lahore: Lesson Learnt 2016-2019

i. Lahore is second largest city of the Punjab. Pilot projects should not be started in complex environment without clarity of ownership. It should be started with easy to difficult situation rather than otherwise. Without any bearing and leadership, it was becoming difficult to reach at some agreed denominators because Home Department and Punjab Police did not see eye to eye on many issues including location of site for the PPIC3 Centre Lahore in 2013. After two years of constant deliberations the site was selected to be in Police premises which also addressed the issue of ownership of the project.

ii. Project Directors (PD) should have autonomy for selection of their team and it should be under an oversight mechanism through a single line of command. In the scheme of things, PD not only designed the human resource structure but it was very flexible and dynamic. Resultantly, PSCA had a continuously evolving organizational structure as conceived, operated, modified and remodified by the PD and his team.

iii. PD should also have the ability to engage right resources at a short notice through head hunting instead of long-term employments. Many a times, in an innovative project for which no precedence is available, need of resources arises at a short notice period and in that case, engagement of individuals or firms becomes critical for support of the project team.

iv. Strategic planning is key to cost effectiveness and to efficiently utilize the resources. Engagement and retention of resources depends upon the long-term plans of the organizations. There was no clarity about scope, outputs and outcomes of this project. This is a fundamental point and at the next stage after completion of existing scope, scalability and up gradation of project need high level decisions. These decisions have to be taken from

outset so that resources may be utilized properly. If a forward-looking approach is not adopted and once teams are dispersed, it is difficult to reform the teams.

v. Time scale for project completions should be realistic and enforceable. Proposed completion time of thirteen months for the project proved unrealistic due to multiple reasons including intransigencies of the implementing partner. The contractor wanted to win the project at any cost because they had forecast that this industry will expand in a country like Pakistan and world over due to dynamic expansion of technologies it employs. They did not have deliverables ready or available which they had promised in the bidding stage. Resultantly, project delivery was delayed considerably. All said and done, the project timeline was not respected as per the proposed plans which is not a desired outcome of the project management.

vi. Management structure of PSCA was key to achieve positive results. Without a working management, projects could not see the light of the day. Identification of a champion of change and giving him/her the right resources and encouragement is critical. He should know how to lead and take all stakeholders along with him through a good communication strategy. PSCA kept on evolving its organizational structure as per changing needs. This continuous evolution is the key requirement in all startups and in mega complex and innovative projects like PPIC3 centre Lahore. It started with one person on August 10, 2015 and now there are 1024 employees in PSCA in January 2020.

vii. Human resource management is key for all projects and it is essential to engage professionals of all relevant fields. Lahore PPIC3 Centre was started in 2013 and by 2015 it was regarded as a sick project of the Government of the Punjab. Nobody was willing to join this project in any role.

It took more than one year for the project director to recruit first of its expert in the field of IT. PSCA faced serious hurdles in recruitment processes by the government agencies and it hampered the growth and created stressful conditions for project delivery. Although PSCA has satisfactorily faced all such obstacles but time was wasted and so were resources. This affected the project implementation process. First and fore most task for a project director is to create a clear and functional human resource plan next only to financial plan for any mega complex project.

viii. Project managers need support from all tiers of the government. It is important for all parties that contract payments are processed on time and support from the financial tiers is mandatory. It is not possible for any one executing agency to meet all targets of delivery and payments unless due support is provided especially for foreign components. In case of PSCA, payment to international consultants was through state bank of Pakistan and it was at times causing concerns that payments could be delayed.

ix. There should not be too many uncertainties and experimentation in any project. In case of technology, many people make claims and hamper the growth on the pretext of security and their capacity but detailed analyses informed that claims and outputs are much lesser than desired outputs. Economy of scale and available off the shelf items and products must be accepted and indigenous solutions may follow. Indigenous products may be preferred where capacity is available, however, it should not be an excuse to make progress.

x. Their processes must be streamlined for mega projects to facilitate the implementation. Local infrastructure and power issues are still critical for high tech projects because at times project team is not aware about relative importance of service providers. Lahore Electric Supply Company (LESCO) was not cooperative and they caused hurdles in completion of the

project. It was not considered that critical but due to delay in dedicated connections for each camera site and the main data centers extra cost was incurred and it affected on the completion of the project.

xi. Decision making forums need to be smaller in size and efficient. PSCA had to go from committee to committee where very senior officers were present, it was difficult to get decisions. It was made possible only through the personal activism of someone no less than Chief Minister Punjab to go to the micro level details at times. There was no time table to oversee the matters of the Authority. In this situation, some members of the Authority, started interfering in the day to day business of the project and undermining the position of lower tiers of the project. For vendors it was confusing as well as time consuming to address multiple meetings for trivial matters and it hamstrings the progress of the project.

xii. Anti-Corruption measures should be strong. PSCA developed its own policy of conflict of interest and it was useful in awarding of contracts, recruitment and any other relevant decision making. Special pay packages and market-based salaries are key point after selection of right person for right job. Public sector projects need knowledge of public sector processes and valuable resources from any sector must be valued and placed on merit. Public sector employees worked amazingly well under the PSCA in all fields.

xiii. The organization which is the target of change should act like a host and welcome the change. In this case, Police administration should be on board before any change management process. But here it was not the case. Police operational command was not supportive of the project due to three major reasons. *First*, it was fear of the unknown. Except very few individuals who had an idea about the outcomes, others were not aware of the project, scope, outputs and outcomes. *Second*, it was the fear of reprisals in case they could not deliver the project in time. *Third*, it was uncertainty and

capacity to work in a changed environment and they were apprehensive and unclear about their own position after the change would be implemented.

The Police commanders of Lahore Police started questioning the rationale of the project and hinged their arguments on the cost of the project which was exorbitant, in their opinion, in Pakistani context. It was the single largest project in the history of Pakistan Police worth approximately USD 140 million. Police staff in Police stations also started looking at the change agents in negative manner. More resistance came from Police leadership who thought that PSCA was taking away control from them and it has been designed to hold them accountable. The same leadership was imparted international trainings and awareness but resistance was immense and continues in one form or another. Resistance to business change is but natural and must be tackled at all levels.

xiv. At the planning stage, due consideration should be given to stakeholders' concerns, cooperation and their interests. This also includes parties who are not part of the contract but who will be affected by one way or the other or their cooperation will be required to fulfill some critical tasks no matter how obvious and straight forward they appear. While PPIC3 pilot project was implemented in Lahore there were other projects planned in the same time frame like Orange Metro Line or Feeder Routes project of Punjab Transport Department but no coordination was possible despite that PSCA's consultants NESPAK was also consultant of other parties in many cases. This affected the project activities and timelines.

xv. Capacity of local Pakistani consultants is a major challenge. Over design and lack of timely responses to vendors and an attitude of master and servant will not deliver results. NESPAK authorities were reluctant at times to take professional decisions even if it was in the interest of the project but fear of reprisals and following the codes blindly increased the cost and time of the project. Lack of decision making and red-tapism in the business

affects the timelines. However, the young members of the team were more efficient and forth coming than their seniors. Lack of accountability of the consultants by the client is also another reason of poor performance.

xvi. Contract design and agreement negotiations are critical skills and must be learned before implementing mega projects. Contract should encompass all the relevant matters and must be enforceable. Punjab Public Procurement Act 2004 and Rules 2014 frameworks need improvement for mega projects and must consider the issues of technology related projects and engineering, procurement and construction aspects of such projects. Without competent legal teams it is not advisable to sign projects let alone execution. In all mega projects, capacity of contracts unit is as important as selection of the team lead.

xvii. Stated capacity of the vendors, their claims vis a vis their deliverables are major challenges and factors to be analyzed by the public agencies. This can be done at any level before awarding the contract and it should be done carefully and on pure merits. Unverified yet ambitious vendors do not deliver, knowingly, their promises and make all efforts to save their cost by hook or crook. Their efforts to corrupt public officials must be closely monitored and if they do not fulfill their commitments, necessary penalties must be invoked but rate of penalties should be enforceable. However, before that their issues and limitations must be given due weightage judiciously.

xviii. Ambitions and achievements must be carefully examined. Particularly in technology, there is difference between facts and fiction. Scope definition and keeping the focus is critical for any project and that was also a key lesson from PPIC3 project of PSCA. Project director must keep focus on scope time and cost of the project and not to be led astray by desires of

stakeholders. There will be more pressure to keep on changing the scope of the innovative projects but an able team keeps its focus unaffected.

xix. PSCA focused on getting desired skills and engaging young professionals and this decision proved correct. In particular, gender participation proved a success because it made workforce inclusive and that too from the entire Punjab. Innovation and youth go side by side and it is a very useful takeaway from PSCA. It was a deliberate decision to have young persons recruited in PSCA as change of culture was the key outcome of the project. This selection of young persons was noticed and a case study was devised on this very question. Similarly, gender participation was another key pillar of human resource management of the project. It is highly recommended to include women in the teams and it can be done over all through gender mainstreaming strategy at the organizational level.

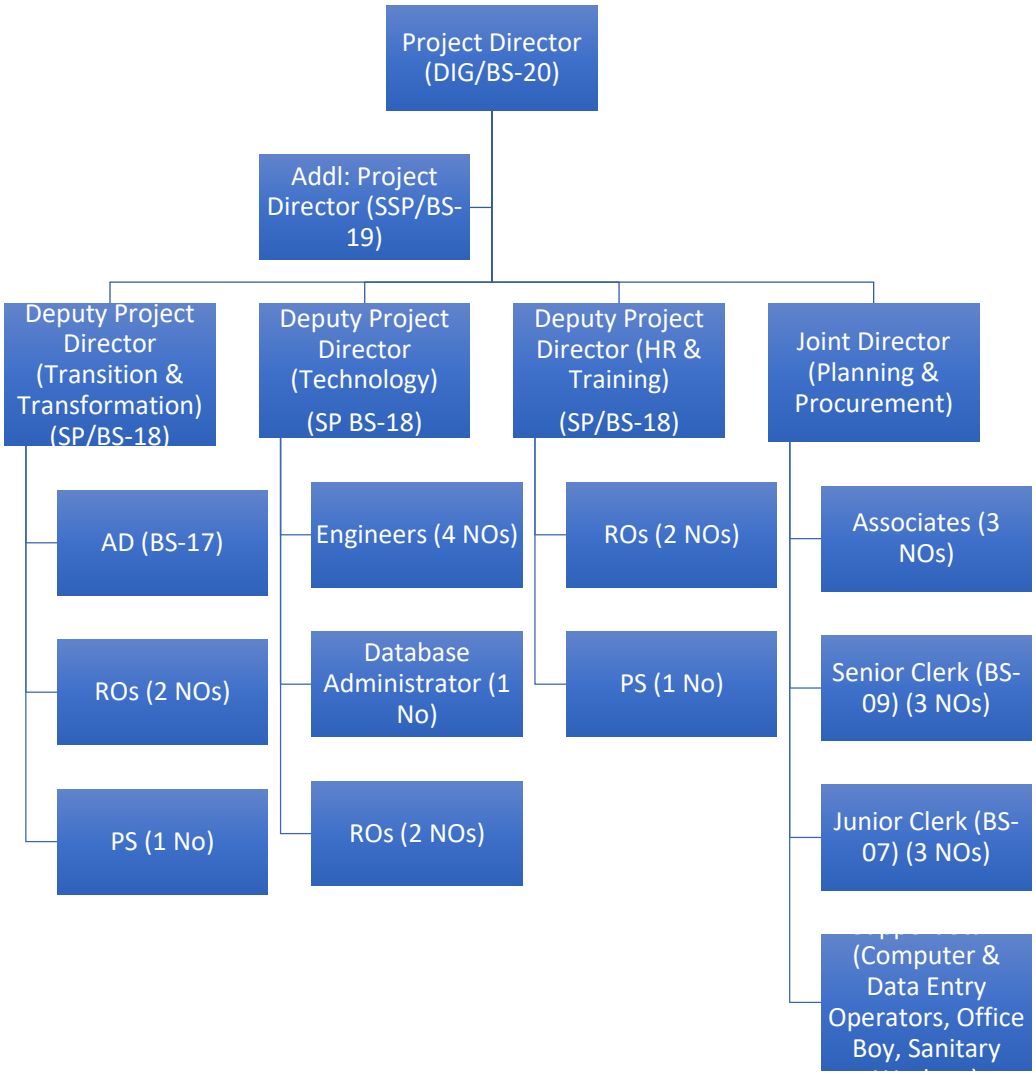
xx. Such large-scale projects are questioned time and again by people about its cost effectiveness. It is important to develop or acquire role for revenue generation for sustainability of the projects like PPIC3 Lahore. PPIC3 Lahore has started e-traffic tickets against violators of the traffic signs and red lights. It has a potential of manifold increase due to continuous operations through cameras. There can be further resource generation plans through project which can be sharing data with cost for planning and enforcement of certain policies like vehicle insurances and cost of investigations for private civil inquiries.

xxi. Infrastructure of PSCA is used for training purposes which is already contributing in lowering cost of other public institutions and an indirect benefit to the governments. There is need to open up the doors for other departments so they can benefit from this public infrastructure. Modalities of this mutual benefit should be designed by the host organisation but it is important to continuously tap the resources and learn from successes of any

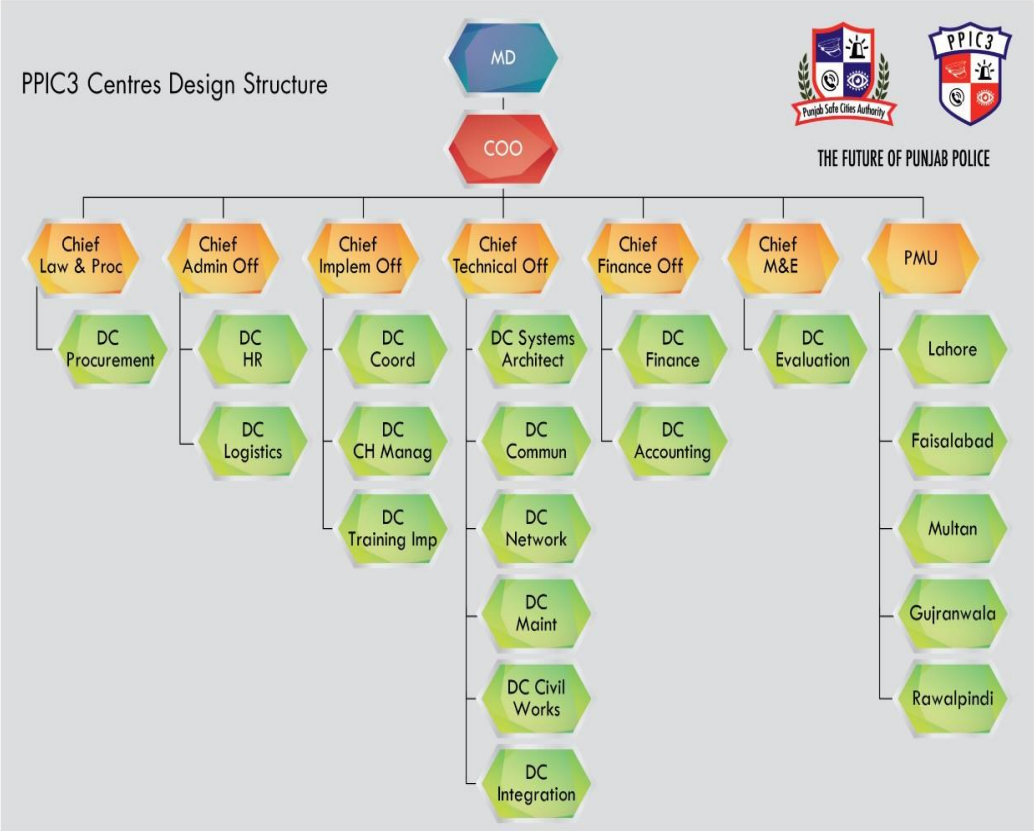
project and keep tapping from existing resources of mega projects. Optimum utilization of the resources is key requirement of public sector resources and it should be kept in mind all the time before starting any new projects in public sector.

Annexure - XIII

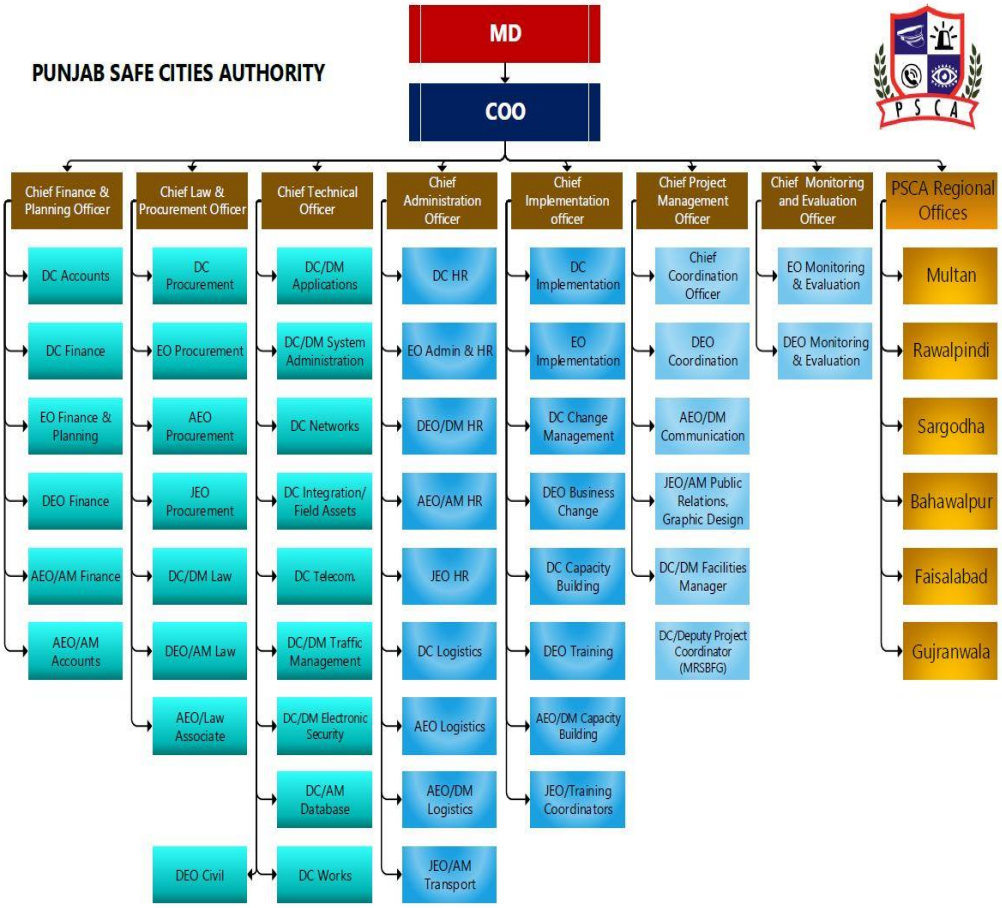
Organogram Project Management Unit (Phase-I)



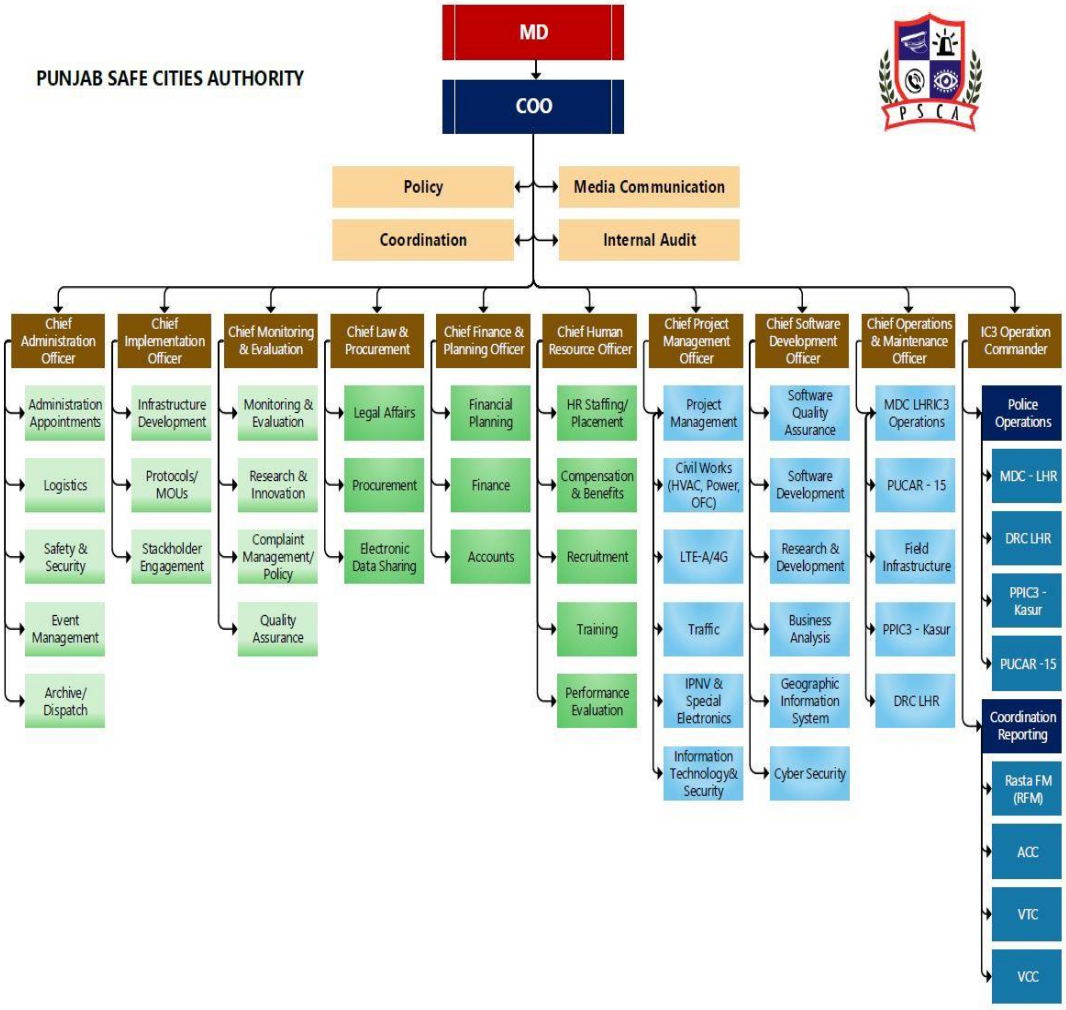
PSCA Organogram (Phase-II)



Organogram (Phase III)



Organogram (Phase-IV)



Annexure – XIV

Change Management in Human Resources

Beginning of a New Police Culture
November 10, 2018

Change Management in Human Resources

A Case Study of Punjab Safe Cities Authority

On the eve of July 17th 2015, two days before Eid holidays, the Chief Minister (CM) Punjab while chairing a meeting of the Provincial Committee on Law & Order asked the participants "is there anyone in this room who can look me in the eyes and say that he can deliver this project or should I ask my Chinese or Turkish friends to please come forward as none of the members in this room has the capacity to do so". All heads were bend down and there was deafening silence in the room. Inspector General of Police (IGP) Mr. Mushtaq Ahmed Sukhera and Deputy Inspector General of Police, Telecommunication & Transportation, Mr. Ali Aamir Malik were upset as it was third year of start of this project and PITB had not been able to deliver Police Department in technical domain due to complexity of the project. To be fair, scope of the Project was enormous and beyond capacities of PITB which has capacity of only applications and software development which was only one small component of the project. The Project essentially required Police leadership to embark upon a new journey of Change Management yet known to any other large scale public sector organisation in Pakistan. Chief Minister Punjab who has seen such projects in Turkey and UK, and knowing that local technical capacities were limited contrary to tall claims, was very upset as his electoral plans remained unfulfilled as security situation was not satisfactory.

DIG Malik Ali Amir who was also Project Director since 2013, discussed with the IGP Punjab and explained that there is nobody in the Police Service who could dare to handle this mega project of Rs. 13 billion in a very short time and can also handle the situation on the political end to satisfy the key stakeholders. IGP was thinking about a suitable person. He said, "We have on last option. I can appoint my own staff officer who has recently been asked to leave NACTA and join my office. If he can't do it, Police will not be able to deliver such complex projects in Pakistan."

Background:

As part of official tour to London in 2012, the Chief Minister Punjab visited Metropolitan Police Central Communications Command Centre, Lambeth, London. Upon his return, the CM called a meeting of the Cabinet Committee on Law and Order Punjab and shared his desire to initiate the work on establishment of Punjab Police Integrated Command, Control and Control (PPIC3) Centre Lahore.

i. This case was prepared with the help available record and evidence of Punjab Safe Cities Authority and details provided by Mr. Akbar Nasir Khan, founding Chief Operating Officer of Punjab Safe Cities Authority (PSCA) and an Alumnus of Harvard Kennedy School, USA, and Mr. Hassan Raza, a research officer of PSCA, a LUMS Alumnus, for classroom discussions in academic and professional setting, and is not meant to illustrate either effective or ineffective management. 1

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Challenges:

After the initial meetings, SSP Akbar called the two British consultants available at Lahore office and one officer available to him, to know about the human resources challenges of the project, as illustrated below, faced by the project.

i. Change Management Strategy for project
ii. Hiring and management of consultants in financial, legal, change management, technical and construction supervision fields
iii. Recruitment of Human Resource (HR) of PMU
iv. Planning and approval of HR requirements for PPIC3 Centre Lahore
v. Training and capacity enhancement of Punjab Police to run the Project

PD addressed the issues of strategic management by formation of Punjab Safe Cities Authority (PSCA) for which a legal framework was available in the form of an ordinance. He was the first employee of Punjab Safe Cities Authority and founding COO. On May 20, 2016 a contract was signed with Huawei Technologies Pakistan. NESPAK, ARUP consultants (UK) and iABG (Germany) as technical consultants; Ernest & Young financial consultants; and Haidermota BNR as legal consultants were working with him to achieve this unachievable target only six months ago.

In order to develop capacity of the PSCA, to manage and maintain such projects strategically, there was immediate need of experts and specialised human resources. COO PSCA initiated a proposal and a summary was approved by the Authority and the government explaining need, justification, terms of reference and KPIs of each post and position in the PSCA. There were 93 members of the PSCA but real challenge was the 666 positions of technical IT operators required for running the project in an efficient manner for which nobody in Punjab has any experience nor a model to follow.

International Best Practices:

Some guidance was available in the international arena for operational level staff of command and control Centres. In Turkey, the Police command centers have video surveillance systems which are deployed in all major cities and these are manned by Police officers. Same is the case in London, Chicago, Beijing, Mexico City and Istanbul. DIG Telecommunication, the first PD of the project also got approval for the case for recruitment of 300 Police officers in Basic Pay Scale 5 as Police constables to be working in the PPIC3 Centre. The criteria for recruitment of Police Constables is provided in

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designed project is to change the Police Culture and bring business change in everyday Police operations and investigations. This needed a different approach, altogether.

Alternative Approach:

With the approval of the Chief Minister, the recruitment process was halted on December 25, 2015 and all recruitments processes were cancelled. 62 candidates were issued merit list as Police Constables but their medical test was not done yet. On legal grounds they have not become Police Constables. Knowing that the process is cancelled, candidates filed a writ against the Police Department that they were recruited lawfully and now they must be allowed to join the department.

While contesting case in the High Court, COO PSCA, devised new recruitment criteria for the newly created position of "Police Communication Officers" in new pay scale PSCA -10 of Authority almost equal to BPS 14 in the Police Department **Exhibit 6**. Knowing that safe city projects will be implemented in 7 other major cities of the Punjab, he expanded the recruitment base of the PCOs from Lahore to all over Punjab to make PSCA an inclusive organisation and to increase competition among the youth of the Punjab rather Lahore only. Reputation of the employer was also an issue as young graduates were not very eager to join Police Department as a preferred place after getting 16 years education in IT. It was also an opportunity for young graduates because no experience was required to join as PCO in PSCA. PSCA was a new department and nobody knew its future prospects so not many candidates were attracted to pass the NTS tests and appear for interview.

Chief Operating Officer PSCA resorted to private sector to design specialised training courses for these young graduates and imparted them short but focused training in Life skills, law enforcement, criminal profiling and in specialised IT modules which were being deployed in the Safe Cities Project Lahore. Special attention was paid to spread the word in education centres/universities/colleges to attract talent as communication and outreach strategy. Women and minorities were encouraged to apply. All posts were on contract basis for two years extendable to 03 years but no career plan was provided.

A detailed Service Regulations were prepared and approved by the PSCA Authority to streamline the merit policy, terms and conditions and Human Resource management of PSCA including performance evaluation process. Ernest and Young Financial and

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Management Consultants reviewed and regarded these Service Regulations 2016 as one of the best models available in Pakistan for human resource management.

Chief Operating Officer, PSCA is in consultation with different stakeholders for finalizing service structure for PCOs. As previously suggested, if constables were to be recruited in PSCA their career path is predictable and they are promoted to SSPs and even to DIGs after 30 years of service. Owing to the nature of their jobs in the operations of Police and their promotion structure, they are transferred in different departments over the course of their service and PSCA would not have a permanent human resource with relevant experience in the technical operations of the IC3 project. In addition, they will also get other tangible and non-tangible benefits which are part and parcel of joining the Police Service in Pakistani culture. However, performance evaluation of their efficiency and productivity will be a challenge as it is rare that any delinquent and non-performers can be penalized or expelled from the government structures.

In public sector, including Police department, hiring and firing of a human resource is very tedious and once a resource is hired, it is almost impossible to terminate services of that individual because there are multiple forums available for appeal and restoration in service is possible even after 10 years of litigation. The management is apprehensive that lack of accountability and delayed process of termination of services of employees will lead to a culture of non-performance of the Authority.

In the current process, efficiency and survival of the fittest is possible and if they adopt a new career path then there is no perpetual guarantee of job continuity. There is another question how it will survive in the face of everchanging government policies. PSCA also has developed a performance evaluation plan and in first two years non-performers have been asked to leave the organisation after due process of accountability in a faster manner but high performers are also granted bonuses as per established KPIs. There is zero tolerance against corruption and discrimination against any gender but women particular. Therefore, the decision of recruitment of PCOs is linked with their career planning and there are 11 more Safe Cities Centres in the plans of new government during next five years.

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Current Situation:

It has been 30 months since first batch of PCOs was recruited through a transparent and open competition method. At the moment some 600 PCOs are working on contract. After two years, 30 out of 350 PCOs of first batch has left the job and there is an open question about career planning of 600 PCOs. There are 20% female PCOs and some of them have got married and now demanding for day care centre in the PSCA HQ. Police Supervisors in the Rank of Sub Inspectors and above complain that PCOs challenge their orders and managing female officers is complicated as they get offended if discipline is enforced. Many female PCOs want to work only in day shift and males want to do second job and are not happy with shift rotation. Although they are called Police Communication Officers, they are part of Safe Cities Authority which is a statutory body other than Police. After 2 years' review process, the case of 62 candidates is decided by High Court in favor of Punjab Safe Cities Authority.

PSCA team has attained many successes and have developed their own culture like their own distinct uniform in blue and gray with distinct Police badge and Pakistani Flag. COO PSCA has been working on preparing a career plan and promotion prospects for PCOs. He is thinking whether he should merge these PCOs with Police Department or should retain them as a separate cadre under Punjab Safe Cities Authority.

Please analyse the situation and consider the following:

1. What are pros and cons of keeping Police Constables in PPIC3 Center?
2. What are complexities of gender participation in the work force in security organisations?
3. How Could Police Supervisors manage PCOs better?
4. How for COO PSCA was successful in changing Police Culture in PSCA?
5. What will you suggest if you are asked to advise PSCA for maintaining discipline of his workforce?
6. What do you suggest for the career planning for PCOs?
7. What factors should be considered when developing Human resource strategy for cultural change in an organisation?

---

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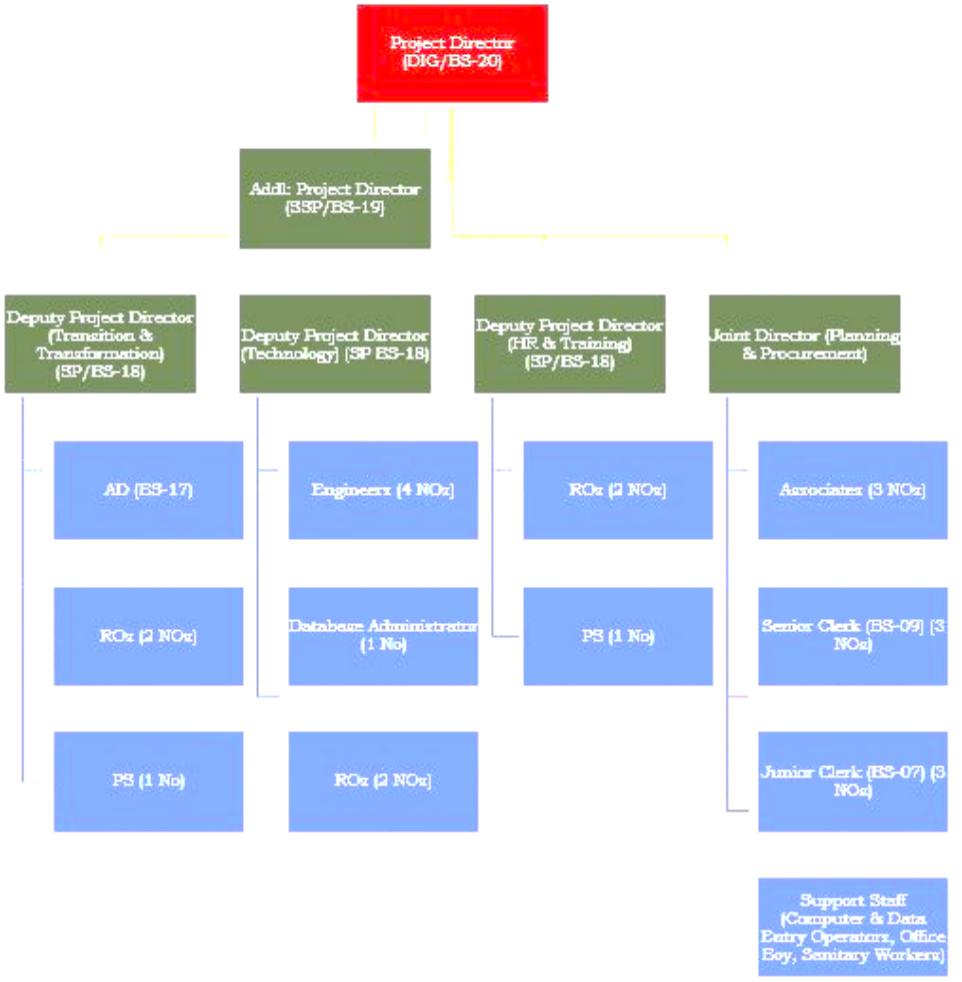
EXHIBITS

Exhibit-1



اشتہار

پنجاب پولیس انٹیگریٹڈ کمانڈ اینڈ کمیونیکیشن سینٹر لاہور میں
پولیس کانسٹیبلان ولیڈی کانسٹیبلان کی اسامیوں کے لیے بھرتی

ضلع لاہور میں پولیس کانسٹیبلان بطور (SOMS) آپریٹرز (پے سکیل نمبر 5 بمعہ مروجہ الاؤنسز کی بھرتی کے لیے ضلع لاہور کے سکونتی امیدواروں سے مندرجہ ذیل شیڈول کے مطابق مجوزہ فارم پر درخواستیں مطلوب ہیں۔

خواہشمند امیدواران مجوزہ فارم جس کی قیمت 25 روپے (ناقابل واپسی) ہے مورخہ 21.09.2015 سے پولیس لائنز قلعہ گجر سنگھ لاہور سے حاصل کر سکتے ہیں۔ درخواست فارم بمع اسناد ضروری مصدقہ کاغذات پولیس لائنز قلعہ گجر سنگھ لاہور میں مورخہ 06.10.2015 تک جمع کروانے ہونگے۔

وہ امیدواران جو فیملی تعلیم کی بنیاد پر اضافی نمبر لینے کے خواہش مند ہیں۔ وہ اپنے تعلیم سے متعلقہ تمام کاغذات جیسا کہ پنشن بک۔ ریٹائرمنٹ آرڈر کی کاپی وغیرہ لے کر اپنی درخواست کے ساتھ منسلک کریں تا کہ اضافی نمبرز کے بارے میں فائنل میرٹ لسٹ میں قبل قانون کے مطابق فیصلہ کیا جائے۔

امیدواران کے لئے درج ذیل معیار پر اترنا ضروری ہے۔

سول امیدوار:

1۔ قد= کم از کم 5 فٹ 7 انچ (مرد امیدواران کے لیے) کم از کم 5 فٹ 2 انچ (خاتون امیدواران کے لیے

2۔ چھاتی= کم از کم 33x34-1/2 انچ (صرف مرد امیدواران کے لیے)

3۔ تعلیم و مہارت برائے SOMS Operator= گریجوایٹ آف کمپیوٹر سائنس (BCS) پاس کے مساوی ڈگری (ترجیح بزنس یا آئی ٹی)۔ انفارمیشن ٹیکنالوجی میں اچھی مہارت MS Office application کے استعمال میں مہارت۔ انگریزی بول چال اور لکھنے میں مہارت نیز کال سنٹر میں تجربہ کے حامل امیدواران کو ترجیح دی جائے گی۔

4۔ عمر =22 سال تا 28 سال

5۔ سکونت =امیدوار کا ضلع لاہور کا سکونتی ہونا اور لاہور کا شناختی کارڈ کا حامل ہونا لازمی ہے۔

6۔ 1.6 کلومیٹر دوڑ 7 منٹ (برائے مرد امیدواران) 10 منٹ (برائے خواتین)

سابقہ فوجی:

1۔ قد، چھاتی، تعلیم، سکونت= جو مندرجہ بالا سول امیدوار کے لئے مخصوص ہیں۔

2۔ عمر = امیدوار کی موجودہ عمر سے اگر فوج کی مدت ملازمت منہا کی جائے تو اس بقایا عمر 28 سال یا اس سے کم ہونی چاہیے۔

علاوہ ازیں موجودہ عمر 40 سال سے زیادہ نہ ہو اور اسے ریٹائر ہوئے دو سال سے زیادہ عرصہ نہ ہوا ہو۔

نوٹ:

☆ بھرتی شیڈول کے متعلق معلومات پولیس لائنز قلعہ گجر سنگھ لاہور سے حاصل کی جا سکتی ہے۔

☆ امیدواران کو قد چھاتی، تعلیم اور عمر وغیرہ میں کوئی رعایت نہ دی جائے گی۔

☆ پہلے سے سرکاری/نیم سرکاری ملازم اپنا فارم درخواست محکمانہ توسط سے جمع کروائیں۔

☆ پانچ فیصد (05%) کوٹہ اقلیتوں کے لیے مختص ہوگا۔

☆ پندرہ فیصد (15%) کوٹہ خواتین کے لیے مختص ہوگا۔

☆ دس فیصد (10%) کوٹہ برائے سابقہ فوجی امیدواران مختص ہوگا۔

☆ صرف وہ امیدواران ٹیسٹ/انٹرویو کے اہل ہونگے جنکی درخواستیں مکمل پائی جائیں گی امیدوار کو انتخاب کے مختلف مراحل میں کئے جانے والے کسی قسم کے اخراجات کی ادائیگی نہ کی جائے گی۔ جسمانی پیمائش و انٹرویو پولیس لائنز قلعہ گجر سنگھ لاہور میں منعقد ہوں گے اور تحریری امتحان NTS کے ذریعے ہوگا۔

☆ محکمہ کو اختیار ہوگا کہ وہ اس اشتہار کو جزوی طور پر تبدیل یا منسوخ کرے۔

ایس ایس پی (ایڈمن)

برائے کیپٹل سٹی پولیس آفیسر لاہور

IPL-12412

i. This case was prepared with the help available record and evidence of Punjab Safe Cities Authority and details provided by Mr. Akbar Nasir Khan, founding Chief Operating Officer of Punjab Safe Cities Authority (PSCA) and an Alumnus of Harvard Kennedy School, USA, and Mr. Hassan Raza, a research officer of PSCA, a LUMS Alumnus, for classroom discussions in academic and professional setting, and is not meant to illustrate either effective or ineffective management. 9

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Exhibit 4

According to Chapter 12, Volume-II of Police Rules 1934

Exhibit 3

Direct appointment of selection grade constables. –

- A height of male candidates should be at least 5' Feet and 7" Inches.
- A height of female candidates should be at least 5' Feet and 2" Inches.
- Chest Size of male candidates only should be at least 33" x 34 ½ "Inches.
- Qualification of candidates should be minimum Matriculation or equivalent degree with 50% Marks.
- Age of the candidate should be between 18 to 22 years.
- Domicile holders of any District of Punjab and CNIC are eligible to apply.
- 1.6 KM Running has to run by a Male candidate in 7 Minutes and in Female candidates have to run in 10 Minutes
- These physical standards shall not be relaxed without the general or special sanction of the Deputy Inspector-General.
- The greatest care shall be taken to ensure that the age of every police officer is correctly recorded at the time of his enrolment and appointment.
- Every recruit shall, before enrolment, be medically examined and certified physically fit for service by the Civil Surgeon
- The character and suitability for enrolment of every recruit shall be ascertained by a reference to the lambardar of the village or ward member of the town of which the recruit is a resident.

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Exhibit 4

SOMS Operator	Posts 480	Salary 30,000/-	Qualification ▪ BCS or equivalent (preferably in Business or IT related subject). ▪ Good Information Technology Skills. ▪ Proficient in use of MS Office Applications. ▪ English (spoken & written). ▪ Experience of call centre environment would be advantageous	Job Description ▪ To receive and process requests for police service via the telephone and other electronic media. ▪ To providing an appropriate, professional and timely response to demand from the public and other stakeholders. ▪ To monitor CCTV footings and arrange their display appropriately ▪ To ensure they are fully prepared for each shift (i.e. attending appropriate briefings, checking technology) ▪ To investigate the nature and circumstances of a call effectively, by comparing information elicited from the caller with IC3 Centre information and SOPs and undertaking risk-assessment to decide on criticality and urgency ▪ To decide what action needs to be taken in relation to the call. ▪ To manage callers' expectations and advise/refer them according to IC3 Centre corporate requirements, deflecting those calls that do not require a police response, to other appropriate agencies ▪ To populate relevant reports where necessary and send them to appropriate recipients Compliance with IC3 Centre policy and standard operating procedures.

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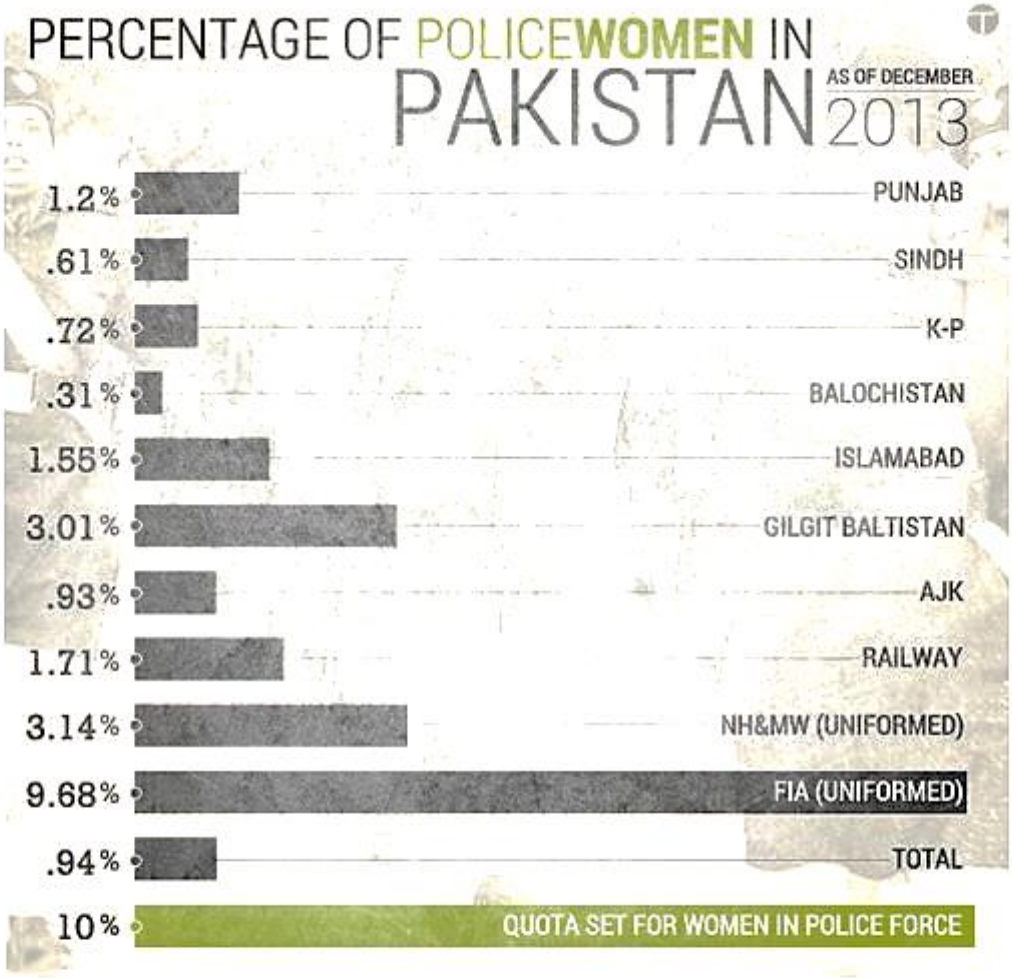
Exhibit 5

According to data from Naional Police Bureu

Biginning of a New Police Culture
November 10, 2018



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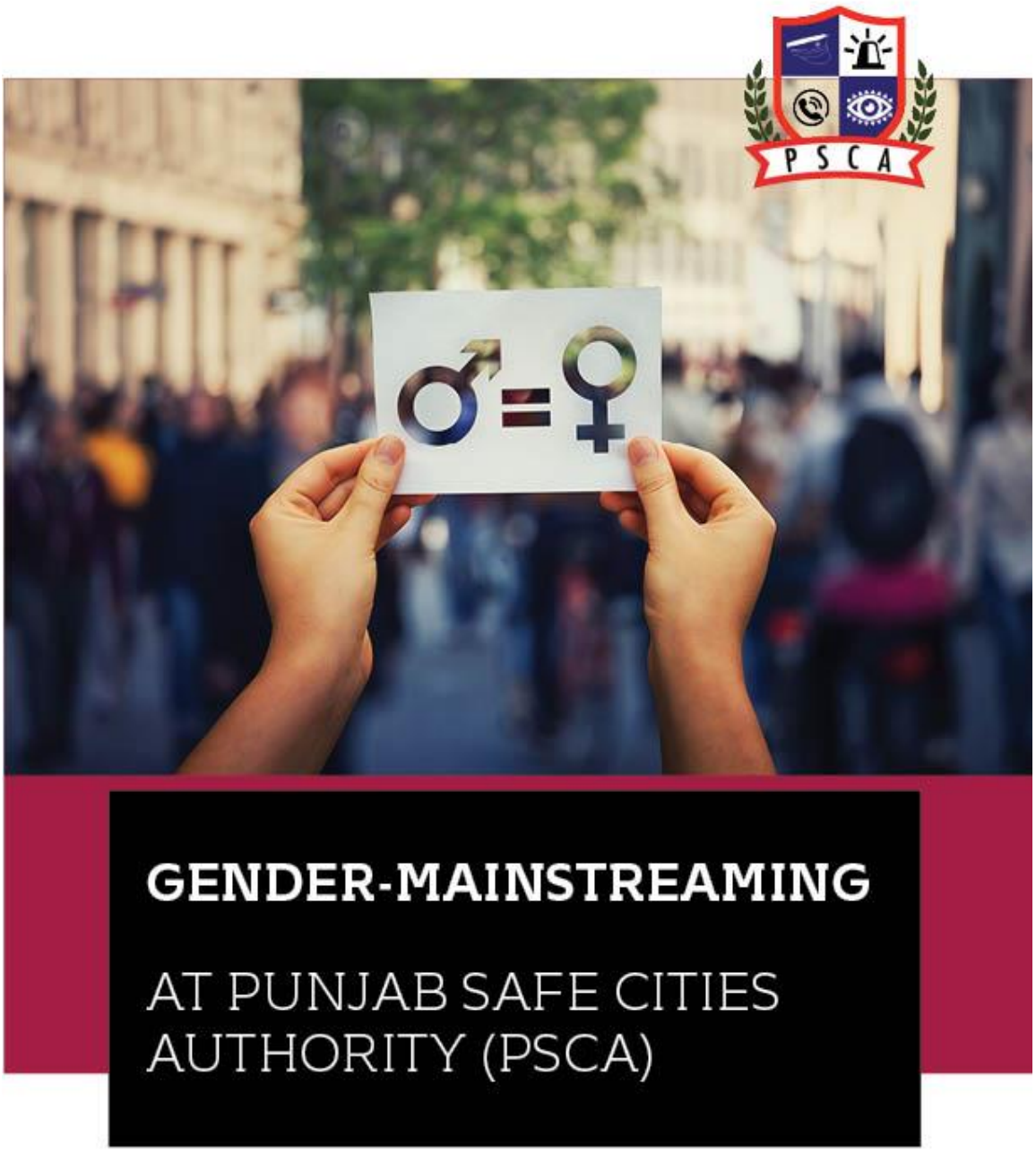
Annexure - XV

Gender Mainstreaming at PSCA



INSIGHTS

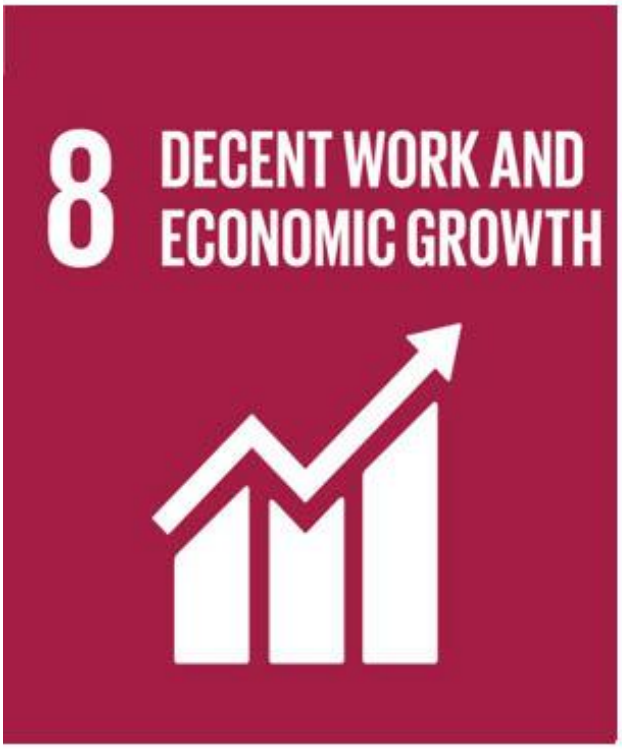
PREFACE

01

SAFE WORKING SPACE

Punjab Safe Cities Authority is a role model and a case study for gender mainstreaming not only in Punjab but also in Pakistan. Through this approach PSCA have managed to provide a secure and progressive working environment to its female staff members in all the offices.

It perfectly complies with "Sustainable Development Goal (SDG) 8" in terms of providing safe and secure working environment to all its workers. Along with Fundamental rights as provided by the "Constitution of Pakistan 1973" this institution rightly observes relevant provisions of all the National Enactments for safety of its employs especially women like,



- Prevention of anti-women practices (Criminal Law Amendment) Act, 2011
- Criminal law (Amendment) Act, 2010 (on Sexual Harassment)
- Protection of women (Criminal Laws Amendment) Act, 2006
- The Pakistan citizenship Act, 1951, Partially amended in 2001
- The protection against harassment of women at the workplace act, 2010.
- Maternity and Paternity Leave Act, 2018

ANALYSIS

02

FEMALE PRESENCE AT PSCA

(COMPARATIVE ANALYSIS)

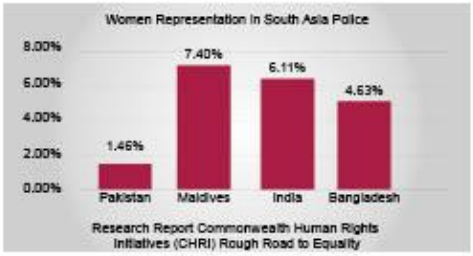
Singapore 19.1	Papua New Guina 5.3
New Zealand 14.6	Thailand 5.0
Hong Kong S.A.R 13.4	Kyrgyzstan 4.9
China 11.3	Japan 3.7
Kazakhstan 10.0	South korea 2.4
Malaysia 9.7	India 2.2
Sri Lanka 5.3	

Table
Percentage of Women police in 13 countries
(Source:7th UN Survey)

According to Seventh United Nations Survey of Crime Trends and Operations of Criminal Justice Systems, law enforcement is predominately considered a male profession in the world. Demographic shows the highest percentage of women representation in police department is in Singapore which is 19.1 percent of its total police strength. Most of the Asian countries have less than 10 percent women percentage in police department, which is not very promising situation.

It is a sort of negation of women rights when male officers have to deal with female accused and prisoners due to lack of female police force.

Commonwealth Human Rights Initiatives' (CHRI) report rough road to equality gives us a closer picture of our surroundings, even south Asia region have highest women police percentage in Maldives which is 7.40%. Pakistan have overall 1.46 percent female police, which have grown from 0.94 percent during the last years. Although it is a positive sign but there is still a long way to go for Pakistan to obtain reasonable percentage in police force.



204,910,439 is the total population of Pakistan in 2019 according to the estimation of United Nations, having 106,449,322 women which constitute 48% of its total population. According to officials quoting data compiled by the National Police Bureau (NPB), there are a total of 391,364 police personnel across the country, of which only 5,731 are women. This number is too less to cater the issues of a large part of population. In Punjab there are 2,804 policewomen which is 1.80% of its total police strength.

2 **Gender Mainstreaming at PSCA**

25% OF TOTAL POLICE COMMUNICATION OFFICERS ARE FEMALE AT PSCA.

- Breaking the taboo of considering law enforcement a masculine profession PSCA have highest percentage of female members as compare to South Asia and all the provinces of Pakistan.
- Overall having 20% female staff members, all the departments of PSCA have female representation, which ensures female involvement in all the matters going on in here.
- All the female staff is within the age bracket of youth (15-29), which is a sign of female youth leadership at PSCA.
- 4/5 associate executives working directly with Chief Operating Officer (COO) are female, which marks their leadership role within the institution.

Gender Mainstreaming at PSCA 3

SAFE WORKING SPACE

03

WOMEN FRIENDLY ENVIRONMENT OF PSCA:

THERE ARE CERTAIN SPECIFIC FEATURES OF THIS WORKING SPACE MAKING IT PERFECTLY SECURE FOR WOMEN IN DIFFERENT ASPECTS,

01

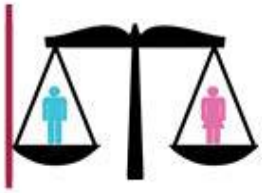
EQUAL LEADERSHIP OPPORTUNITIES:

No gender biasness is taken into account at PSCA. This institution provides equal opportunity of growth and advancement to all of its staff members, only on the basis of their commitment level and hard work. If a girl is hardworking and passionate enough to work on any post, she will be getting all the possible support and assistance for working without any hindrance.

02

WOMEN REPRESENTATION IN ALL DEPARTMENTS:

All the departments of PSCA have female representation. It can be said that female narrative is included in every decision or policy, because of their involvement in all the ongoing matters.



03

EQUAL PAY TO FEMALE STAFF:

There is no inequality in the salary of staff on the gender basis. Every individual working on any post will get his or her salary according to the Punjab safe cities authority, Service Regulations 2017, which has nothing to do with the gender of the employee in specifying the salary of any post.

04

PICK AND DROP SERVICE FOR FEMALE STAFF:

As a unique feature of PSCA all the female staff is provided with pick and drop service to ensure their safety and comfort even outside of the premises.

4 Gender Mainstreaming at PSCA

05

ZERO TOLERANCE AGAINST HARASSMENT:

PSCA has a very clear narrative of zero tolerance against any type of physical or mental harassment against girls. It is mandatory for all the employees at PSCA to follow the policy of mutual respect within premises for making environment professionally comfortable.

06

WOMEN IN SPORTS:

PSCA provides equal opportunities of sports activities to women. These activities not just polish their leadership qualities but also prove as a source of physical fitness, along with tremendous fun and bonding. No gender discrimination is ever taken into account regarding sports initiatives at PSCA.

07

MATERNITY LEAVES:

Under the PSCA Service Regulations 2017, female employees of the Authority are entitled to avail ninety (90) days maternity leaves with full pay. This is another measure of the institution to ensure the comfort level of women employee in line with the national enactments.

08

DAY CARE CENTER:

This facility will provide a comfortable atmosphere to the kids and their mothers during the working hours. Women are able to duly concentrate on their work while their toddlers are being taken care at their own office.

09

PRAYER ROOM:

Separate prayer room is available for the girls, so that they can pray comfortably without any kind of inconvenience.

ACTIVITIES
04

CELEBRATIONS/ACTIVITIES

INTERNATIONAL WOMEN DAY:

Women day celebration is a regular feature of PSCA, which make this institute stands out in public sector organizations. It is a recognition and sense of empowerment given to women who are associated with PSCA. It is a dedicated day for women which is celebrated for them and by them every year. Malik Ali Amir (Managing Director, PSCA) have direct interaction with female staff in order to have a closer look at their concerns, which they are facing at PSCA. This activity gives a sense of ownership to women by the department or institution which they are working at. It also has a positive effect in shape of better sense of affiliation for women, which ultimately increase their productivity as an employee.

INTERNATIONAL DAY OF PINK:

Pink day is celebrated worldwide with the purpose to erase all kinds of Bullying and Discrimination against women. PSCA commemorate Pink day and provide an opportunity to its female to have a progressive discourse over the international standards of safety. This not just marks the concern of PSCA for the security of its employees and especially women also equip women with theoretical information, which will be useful for their future as a working women.

Capacity building activities are very important for every institution in order to get maximum outcome from their employees. Punjab Commission on the Status of women had an informative session with girls organized by PSCA in order to enhance and polish their skills and abilities.

The national commission on the status of women (NCSW) is a statuary body which examines the policies, rules and regulations affecting status of women, monitor mechanisms and institutional procedures for redress of violations of women rights. Their visit to PSCA marked the importance that PSCA authorities give to women safety and security not just theoretically on papers but practically on ground as well. It is an external monitoring or cross check on the women enabling policies of PSCA.

WOMEN PARTICIPATION IN CULTURAL ACTIVITIES:

PSCA provides its employees opportunity to showcase their talents through different cultural activities. These informal gatherings are a great source of bonding and networking among all the employees, where they can participate and learn. Women are duly encouraged to participate and get chance to present their talent, it enhances their confidence in professional life as well.

RECREATIONAL TOUR

Along with professional excellency PSCA also provide its employees especially women recreational opportunities, to explore the country and learn the disciplines of team work and networking. Site visit gives a chance to explore different regions and areas of Pakistan.

WOMEN SECURITY

05

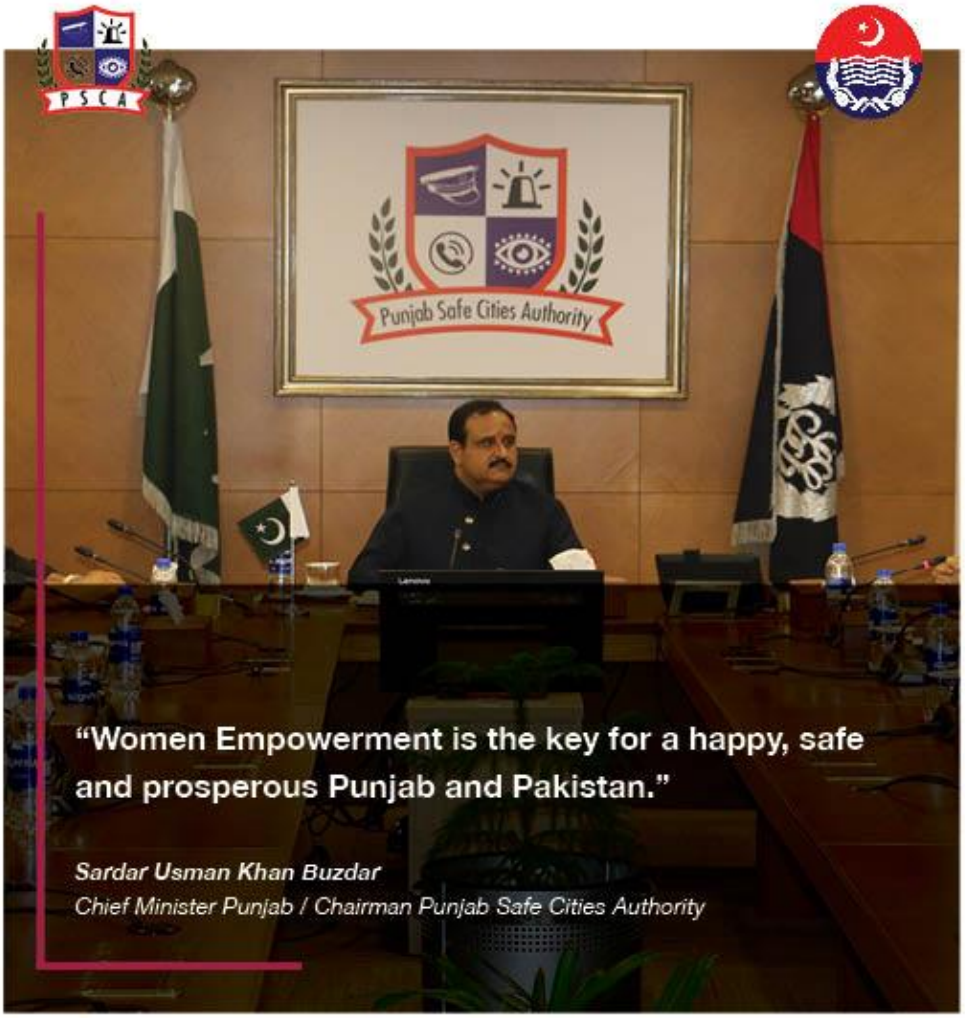
WOMEN SAFETY APP

HAVING WOMEN EMPOWERMENT AS ONE OF ITS CORE VALUES, PSCA HAVE LAUNCHED WOMEN SAFETY APP FOR NOT JUST ITS OWN STAFF BUT FOR THE WOMEN IN THE PUNJAB AS WELL. THIS APP CONTAINS ALL THE LAWS RELATING TO WOMEN SAFETY IN PAKISTAN ALSO THROUGH THIS APP WOMAN ARE ABLE TO CONNECT WITH POLICE, TRAFFIC POLICE, FIRE BRIGADE, HEALTH SERVICES (1122) AND STREET HARASSMENT HELPLINE 1043 IN CASE OF ANY ISSUE WITH A SINGLE TAP.

8 Gender Mainstreaming at PSCA

Women Safety

"PSCA has a unique standing in public sector in terms of women empowerment and security in Punjab. This model can rightly be followed by public and private sector organizations in Pakistan."



Contact Us

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Annexure - XVI

Perception Survey: Early Impact of PSCA 2017-2020

PUNJAB SAFE CITIES AUTHORITY

PERCEPTION SURVEY 2017 - 2020

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1. Introduction

According to UN Population Division data that, the 56% of the world's population who live in cities today will rise to 68% by 2050.[1] Public safety refers to the responsibility and role of the state to ensure the safety of its citizens, assets, organizations and institutions against threats to their well-being as well as the traditional functions of law and order.[2]

The Safe City is a concept for returning security and quality of life to today's complex cities through the use of technology, infrastructure, personnel and processes.[3] The construction of Lahore Safe City Project was started in May 2016 which was designed to ensure security and protection of people whereas intelligent traffic management system, anti-terrorism monitoring network, integrated emergency response, modern communication system and other features were introduced under the project for the first time in Pakistan.[4]

The system was partially made operational since October 11, 2016 however, other were operationalized on January 4, 2018.[5]

This public perception survey was done in January 2020 in order to analyze the services of Punjab Safe Cities Authority as these are viewed by the general public.

[1] (Safe Cities Index 2019-Urban security and resilience in an interconnected world, 2019)
[2] (uclegal.com, n.d.)
[3] (Punjab Safe Cities Authority, n.d.)
[4] (thenews.com.pk, 2018)
[5] (psca, 2019)

2. Methodology

2.1. Research Design

This research design was explanatory in nature in which objective was to investigate the Safe City Public Perception in Lahore. Type of investigation was non-casual studies [Descriptive study].

2.2. Population

The primary data is collected from the citizens of Lahore. For this purpose, seven main areas including M.M Alam road, Mall road, Main Boulevard Gulberg, Johar Town, Circular Road, Badami Bagh and Shahdra were selected. In each selected road, total 15 locations were marked such that it covered business locations, educational institutions and commercial locations. Selection of these areas is based upon social conditions and to cover low, medium and high density of population, geographical spread and infrastructure in these areas.

2.3. Sample Size

A sample of 2079 anonymous individuals was targeted among the population of Lahore to fill an online-questionnaires through face to face interviews. The data from the citizens of Lahore was collected by on-board survey. As per research criteria sample of 500 is sufficient for the randomized controlled survey for public perception, however, a larger sample was used for data collection[6].

To be a representative sample, it included respondents from both genders and diverse backgrounds, professions and age groups so that results can be representative of the population. Percentage of various participants from above perspectives are also realistic for Lahore.

2.4. Sampling Technique

Stratified random sampling is used in the study because stratified sampling is being the most representative of the population. It ensures

[6]

each subgroup within the population, receives proper representation within the sample; which results in greater precision.

2.5. Time Horizon

Cross-sectional study was chosen for conducting research; because the data is gathered once over a period of time, in order to answer the research questions.

2.6. Unit of Analysis

The unit of analysis were individuals.

2.7. Data Collection Technique and Procedure

The purpose of the survey used in this study is to gather statistical data on Public Perception regarding Safe City of Lahore. This research employs a questionnaire survey to collect perception data from the citizens of Lahore. To maximize the response rate and enhance the quality of findings a number of aspects had taken into consideration, out of them an online-survey design has been chosen, in order to minimize the paper wastage & adopt environment friendly technique. An online questionnaire was designed on Google docs.

3. Analysis and Interpretations

3.1. Demographics:

Data was collected through an online survey conducted in Lahore. Average duration of each interview was 10 - 12 minutes. In total, 2079 participants filled in the survey, with 83% males and 17% females. On the other hand, people from all age groups were surveyed. 38% of the respondents were aged between 18-28 years whereas 34% of the respondents were 28-38 years old as portrayed in figure 1. Similarly, 22% of the citizens were of 38-48 years of age, 5% of 48-58 of age and remaining 1%

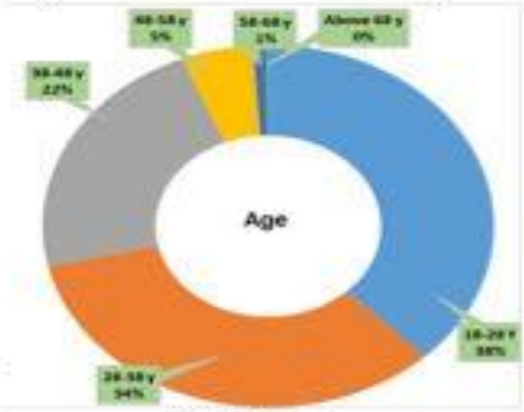

Figure 1. Age

were of 58-68 and above 68 years of age. Following pie chart depicts these statistics:

Figure 2 shows the occupation of the respondents. It is vivid that people from all occupations have been accounted for in this survey. The percentage of people surveyed who were working as employees i.e. doing private job is 24% whereas 23% of the respondents were businessman. Moreover, students, labor, public servant and others accounted for 25%, 13%, 5% and 10% of the respondents respectively.

Figure 2. Occupation

Most of the respondents surveyed claimed a Bachelor's degree i.e. 48% of the sample size. Similarly, 10% of the sample had completed schooling up to high school or below and 24% of the people were qualified up to the intermediate level. 10% of the people have completed a Masters/Doctorate degree whereas 8% of the respondents were illiterate.

Figure 3. Education

Monthly household income is a key measure that effects the response and perception of an individual. The respondents were asked about their monthly household income in the survey.

The results are depicted in figure 4, 27% of the respondents did not revealed their monthly household income whereas 6% of the people told that their monthly

Figure 4. Monthly Household Income

household income is below 25,000 rupees. Moreover, there were 19%, 24% and 20% respondents within the income bracket of 25,000 to 50,000, 50,000 to 75000 and 75,000 to 100,000 rupees respectively. Following is the pie chart showing these percentages:

3.2. Descriptive Analysis

The first part defined demographic characteristics of the participants. In the second part, we asked for the individual perception regarding services provided by Punjab Safe Cities Authority. Data was analyzed descriptively.

3.2.1.Awareness About PSCA

Figure 5 illustrates that 25% of the respondents are well known about PSCA, 57% of the respondents knows little bit about PSCA, however 18% of the respondents have no knowledge about PSCA.

PSCA has good presence on social and electronic media yet the responses call for more information sharing about role and purpose of PSCA and how it is working to achieve its objectives. On positive side, more than 82% are aware about a newly established entity of Punjab Police with the name of PSCA. It is important to mention that PSCA has kept a low profile in its inception phase to manage the expectations of public as well as to manage the spoilers. It is believed that performance will speak for itself but on the other hand, it is also vital to keep the public informed about PSCA so they can reap all possible results from this authority. This is more valid for Punjab Police to have dedicated plans for awareness about its services and to reach out for positive interactions.

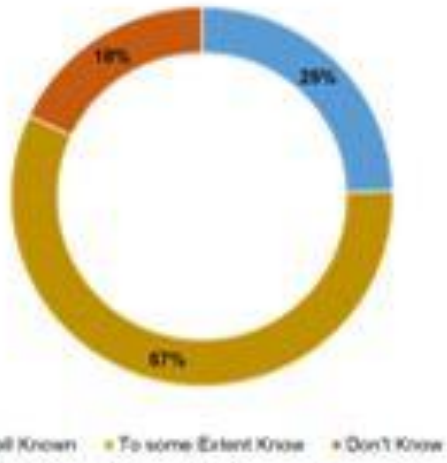

Fig.5. To what extent do you know about Punjab Safe Cities Authorities?

3.2.2.Public Priority

Prioritization of public demand is key requirements for formulation of public policy. Through this survey, it is tried to distill the public demand and they have come up with their thoughts in a structured manner.

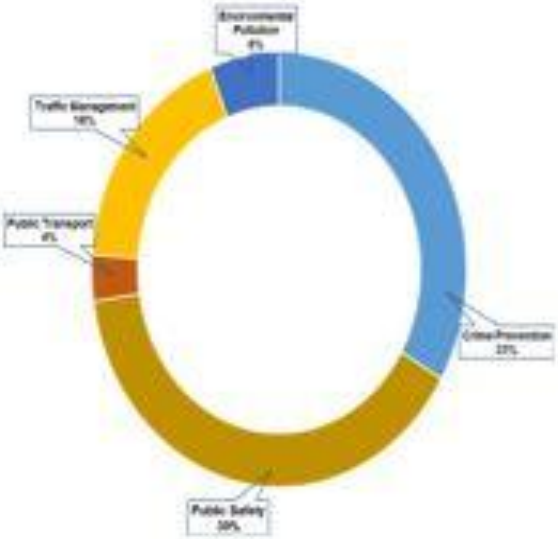

Fig.6a. Among the following issues, which is the most important for your city?

Figure 6a illustrates that the most important issue for the citizens of Lahore is "Crime Prevention" that comprises of 48% and second most important issue is "Public Safety" with 39% of response of the citizens as shown in figure 6b.

There were two questions asked as their top two priorities are crime prevention and public safety. Public safety is explained as prevention from hazards, casualties, pedestrian's safety and any other factors which can harm the public in a day. This means even in public safety, crime is the major concern for the Lahorites and it helps in allocation of resources of Police in that segment. Interestingly, environmental issues and transport are lowest on the public demand. It may be due to fact that focus of the questions or perception of the interviewees was for public security issues and there may be a bias towards the interviewing team and their affiliations. However, this cannot be the only reason as awareness about these issues and choices may have other factors too.

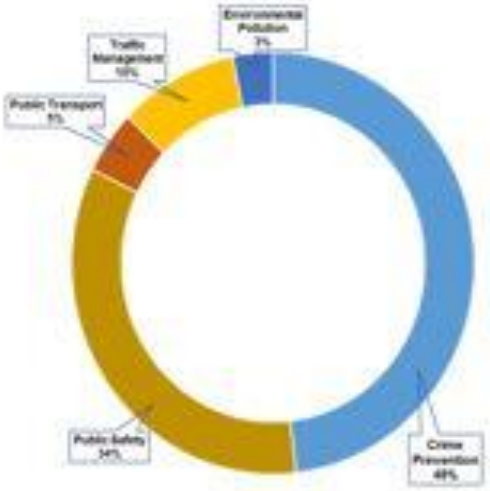

Fig.6b. Among the following issues, which is the second most important for your city?

a cost on society which ultimately affects the economy of a country. Therefore, one of the chief responsibilities of the state is to create and sustain an eco-system where citizens live without the fear of losing their life, property and aspirations.

While asking question from the respondents that how helpful is PSCA in improving quality of life in Lahore 51% of the respondents stated that PSCA is helpful in improving quality of life and only 16% of the respondents found it not helpful.

3.2.4. Street Crime Prevention

On a positive note and in corroboration of

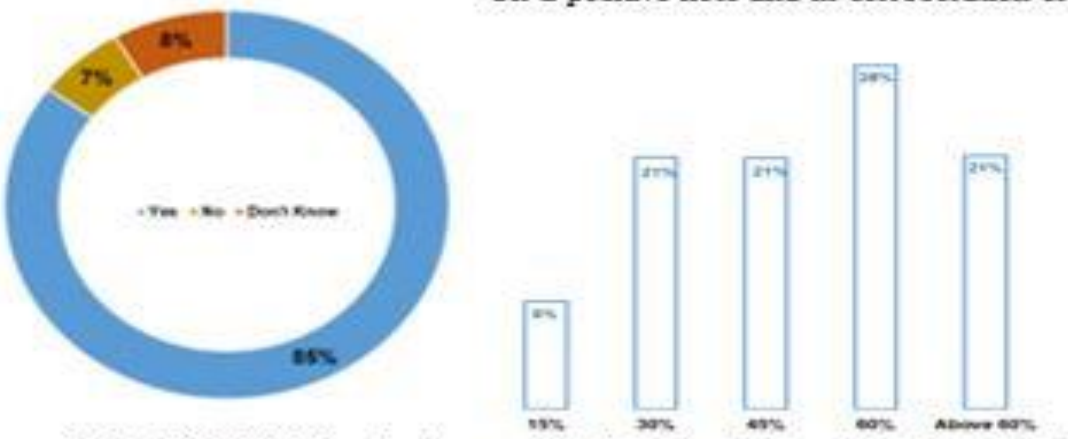

Fig.8. Is PSCA helpful in reducing street crime from Lahore? If yes, then to what extent?

anecdotal opinion of public, regarding reduction of street crime from Lahore, 85% respondents said that PSCA is helpful in reducing crime from Lahore while only 7% of the responses were not in agreement with this majority opinion.

In order to be more specific a secondary question was asked from those who were of the former view to quantify their perception about prevention of street crime. From the 85% of the respondents that to what extent street crime has been reduced? Then 9% of the respondents said that 15% street crime has been reduced; 21% respondents gave weightage to 30% and 45%, 28% gave weightage to 60% and 21% citizens said that more than 60% street crime has

3.2.3. Quality of Life

According to Environmental statistics, quality of life is defined as "the notion of human welfare (well-being) measured by social indicators rather than by quantitative measures of income and production".[7]

In modern times, the quantum of social progress has increased beyond per capita economic productivity to the 'quality of life' concept. While experts have varying means of measuring quality of life, the main focus is on a citizens' subjective 'sense' of well-being and, more specifically, the level of satisfaction with an individual's life. As per different studies undertaken to quantify the 'quality of life' or 'sense of well-being', the major factors associated include real disposable income levels, the employment (or lack thereof) status, health, education, environment and security.

One of the most important aspects of 'quality of life' is safety and security. Economic development and prosperity in any country of the world cannot be achieved without a general sense of public safety and security among its people. Ensuring public security is one of the chief concerns and responsibilities of the state. Thus, public safety poses a big challenge to the government and law enforcement agencies. The issue of public safety imposes

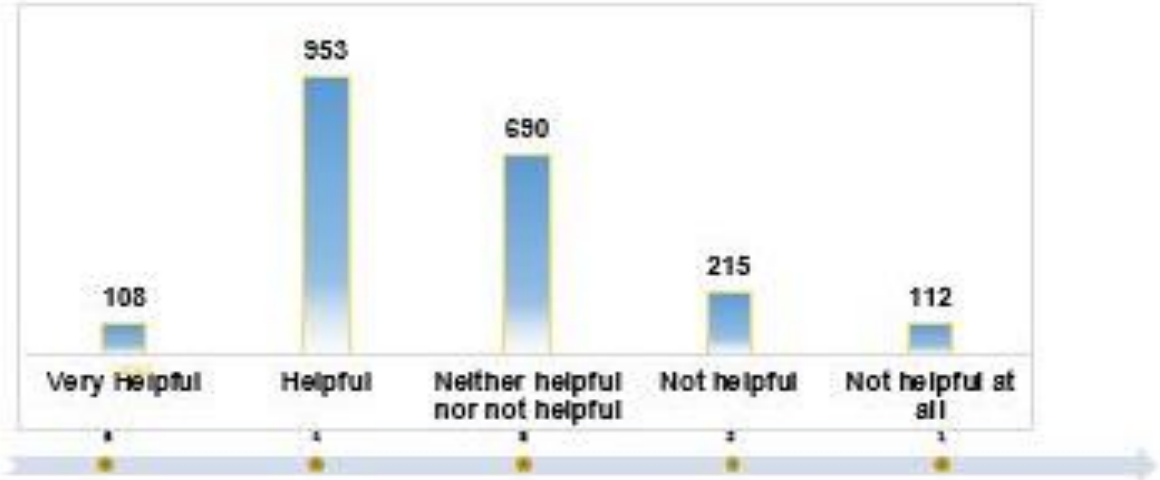

Fig.7. How helpful is PSCA in improving quality of life

[7] (Glossary of Environment Statistics, Studies in Methods, Series F, No. 67, United Nations, New York, 1997, 2005)

been reduced in Lahore due to PSCA. Almost 50% of the respondents opine that 60% of the reduction in the street crime is due to role played by PSCA.

3.2.5. Crime Prevention

Crime is one of the major hindrances towards welfare of the people in any state. While further analyzing from the citizens of Lahore, 48% found PSCA helpful in reducing crime from Lahore. However, 17% of the respondents

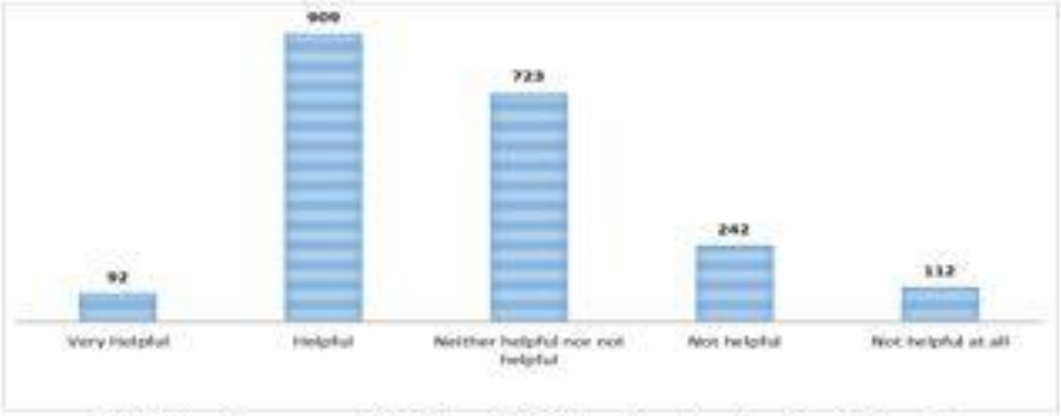

Fig.9. To what extent is Safe City helpful in reducing crime from Lahore?

found PSCA not helpful in reducing crime from Lahore. It is being said that Punjab Police remains the lead organization and PSCA is an arm of the Police to improve public safety and security.

3.2.6. Reforms in Traffic Management System

Traffic Management is the backbone for mobility of urbanization. With the help of technological interventions, PSCA has revolutionized the city of

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Lahore. There was common perception that PSCA has introduced traffic reforms and current improvement in Lahore traffic is due to these changes. However, empirical evidence was important to collect. The questions in survey were asked about the improvement in Traffic Management System in Lahore as shown in Figure 10.

First question was asked to ascertain the key intervention to improve the traffic management. Traditionally, Police has been allocated less funds and paucity of human resources remains Achille's heel of the law enforcement agencies. However, this question was asked to know opinion about role of technology in traffic reforms. An overwhelming, 91% of the respondents, majority mentioned that the traffic management system is being improved through technological interventions, however only 8% of the respondents did not agree with this proposition. This perception of public is in consistent with other changes in the public delivery and global data that technology is the major intervention in public sector reforms.[8]

Fig.10. Do you think that the Traffic Management System in Lahore is being improved through Technological Interventions?

3.2.7. Satisfaction level with E-Challan (Electronic Traffic Violation Management) System

Fig.11. Are you satisfied with the E-Challan system in Lahore?

[8] (Asgarkhani, September 2005) (Antonio Cordella, October 2012) (Seyed Mohammadbagher Jafari, January 2011)

Most glaring and latest evidence of technology intervention in Lahore is introduction of E- Challan where an electronic ticket is sent to the complainant bearing evidence of the violations in pictures with details of time, offence, location and amount of fine. Further asking about E-Challan system in Lahore, 91% of the respondents showed satisfaction with the system and 02% of the respondents are dissatisfied with the E-Challan system in Lahore. This shows that people are willing to pay for fair and transparent system of fine imposition and there is need to introduce more digital services to improve transparency and accountability of the behavior of drivers of vehicles. A corruption free environment with least discretion is another positive aspect of E-Challan, as mentioned by the people in general.

3.2.8. Performance of Police Integrated Emergency Response (PIER) Service

The overall objective of the Punjab Police Integrated Command and Control Centre (PPIC3) Programme to modernize the infrastructure, systems and capabilities for the police to proactively manage the security situation and to professionalize the police response to incidents by moving towards directed and mission-focused deployment of resources. It will enable access and sharing of information within the Punjab Police departments as well as external agencies to ensure seamless service delivery to the public and a more timely and effective response. The infrastructure will provide information and intelligence to ensure that informed decisions are made with regard to priority and allocation of the most appropriate resources in response to calls for assistance.

Provision of high-quality emergency response systems to the residents and visitors to Punjab and specifically Lahore is one of the key objectives of this programme. It will help in delivery of flexible operational systems that can evolve and expand with the evolving needs of the Punjab and Pakistan.

While asking about Performance of Police Integrated Emergency Response (PIER) Service by dialing a voice call on 15, in Lahore, 89% of the respondents showed satisfaction with it. However, only 4% of the respondents showed dissatisfaction with the PIER 15 services of Lahore. This is most utilized service of PSCA and role of Lahore Police is very significant in providing emergency response servcie. This number shows that operations part of Police has considerable improvement and public confidence is high on Police and PSCA in this aspect.

PIER-15 or Rescue 15 or Policy Emergency Response @15 is a system similar to 911 of USA or 999 of UK or 112 in Europe. However, the Lahore based system is unique because it is an integrated system to call Police, medical care, fire fighting and other services through only calling at one number 15. In Punjab Police Command, control and communication Centre (PPICS), this one window opening is provided and each case is addressed as per requirement.

On daily basis 12000 to 15000 15-calls are received from Lahore out of which approximately 85-90% are the invalid calls. A valid call is one where the caller need a piece of information or physical response of Police. Response time of each actionable call is measured and case is closed after getting feedback from the caller and entering in the system so it remains available for future use.

Invalid calls are of many types. 85% of the time of callers is wasted to address these calls. Part of it was reduced by introduction on an interactive greeting for 03 seconds to tell the caller it is Police Emergency Helpline.

Fig.12. Satisfaction level of Lahore-15

This has resulted in dropping of calls by 25% of the total calls made to PIER 15. During survey, people were asked that from their point of view, why people used to make invalid calls at 15? 51% of the respondents considered it as 'time pass', 36% considered as 'to irritate others', 12% assumed it as 'by mistake'. However 1% considered as "others" which described it as a child call or make call for fun.

3.2.9. Safe Travelling in Day and Night Time

Fig.13a. Travelling during day time

Fig.13b. Travelling during night time

Fear free movement is a positive indicator for a safe and smart city. Safe and sound travelling by people has indirect bearing on choice of people to live or visit any city. It is also connected socio-economic development through increase in tourism, urban mobility and even to attract foreign direct investment in a country.

By asking people that travelling on roads is safe in Lahore during day and night time; 85% of the respondents feel safe while travelling during day time and 66% of the respondents feels safe travelling during night. Figure 13a and 13b shows the results.

3.2.10. Time Saving through Rapid Mobility

In another study conducted by PSCA and co-author Mr. Muhammad Hassan of this report, in 2018, it was found that before introduction of E-Challan in Lahore, cost of congestion was equal to almost one billion dollars per year. This cost included extra time spent by users on the roads due to slow mobility

and extra time taken to reach their destination among other factors. It was important to know public perception about change in their travel pattern in the city and how modern traffic management system was helpful in terms of time they spent on the road. It goes without saying that Traffic Police have adapted to the new system in Lahore and in larger parts of the city, its manual handling of traffic Police which is performing its duties to maintain the traffic flow in the city.

On question about any change in the travelling pattern after introduction of e- Challan, 68% respondents mentioned that their travel time has been

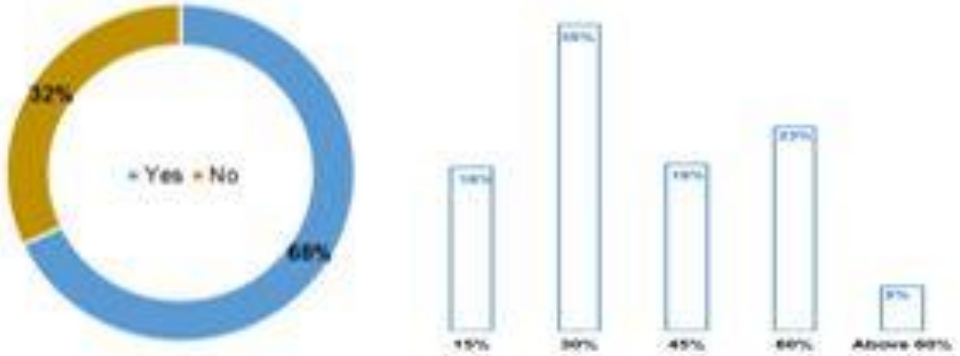

Fig.14. Do you think that your travel time has been reduced since last one year in Lahore? If yes, then to what extent?

reduced since last one year in Lahore. Among these respondents when it was asked to quantify the reduction of travelling time on daily basis, 18% stated that there is 15% decrease in travel time; 35% respondents rated 30% and 19% said that 45% decrease in travel time has been done. Moreover 23% of the respondents agreed with the 60% reduction of travel time and 5% agreed with reduction of more than 60% travel time.

3.2.11. Surveillance and Security

People were asked that do they feel secure with the installation of cameras in public places. 77% people feel secured with the service and 23% of the respondents don't feel secure with it. Pakistan has concept of privacy ingrained in its constitution since 1973. There was no data available to present that this modern surveillance infrastructure was installed on the basis of any public demand but international best practices were followed by the Police. This survey confirms the view point of respondents who accept to be under surveillance and making a trade off in favor of security at the cost of privacy. Still there are 23% respondents who have different perception about public surveillance. No further probe was done about causes of acceptance or denial of the participants, however, this remains another area for further exploration.

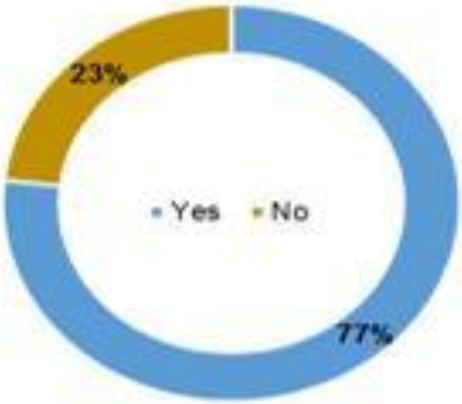

Fig.15. Feeling secure with installation of cameras

3.2.12. Choice of Public Spending

Prioritization of spending is key political function and it determines outlook of any ruling party. It is normally considered that people do not have a choice in spending the public money. The survey question was aimed at getting the choices of the people in this connect and two options were given whether it should be on conventional policing through Police station which needs resources or for Policing through command centers i.e. PSCA model. In

Fig.16. To improve security situation, if the Govt. has 10 crore Rupees; where would they prefer to spend?

response, 86% of the respondents prefer to spend on 'policing through Safe City Command Center' and 16% showed their preference to spend on 'policing through police stations'. This figure also illustrates the satisfaction of public towards Safe City Command Center. It shows the shift in trust of the people of Lahore on PSCA managed policing. Transparency in financial management, visibility of modern infrastructure, less human interaction and positive communication of PSCA may be the plausible reasons for this trust on PSCA. Given that almost a similar number of people know about PSCA, shows that it has gained confidence of people for law enforcement function of Police. PSCA claims to be "Future of Punjab Police" so it is an acceptance by vast majority of people that this form of Policing in Punjab is a preferred choice for public spending. There is need to further propagate this aspect of Punjab Police to attract more financial resources for establishing similar command centres in

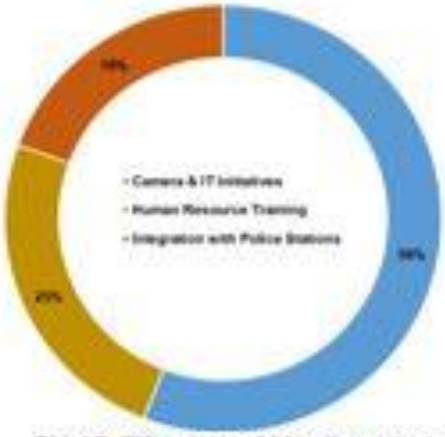

Fig.17. What should be the priority of PSCA?

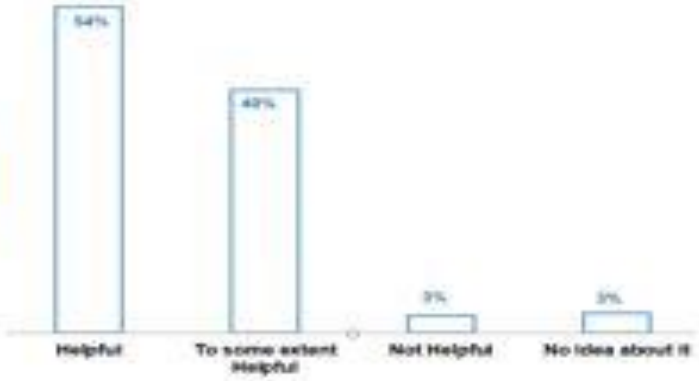

Fig.18. Do you think that PSCA is helping to introduce advanced technologies and modernization in Lahore?

other districts of the Punjab and elsewhere.

3.2.13. Agenda Setting for PSCA

In prioritization scenario, it is commonly asked question by people that how and when this system will be connected or integrated with Police Station. People expect and demand for change in conventional policing business so that fruit of modern intervention reach most of the public. Similarly, it is also mentioned that Police need training and capacity building to improve its performance. When people were asked that what should be the priority of PSCA? Then 56% of the respondents prefer to prioritize camera and IT

initiatives, 25% rated human resource training and only 19% gave their priority towards integration with police stations. This may be due to trust on the technological interventions and initiatives and still there is need for all three steps to be taken.

3.2.14. PSCA as a catalyst for modernization

In the end, responders were asked to give their opinion about role of PSCA for technological advancement and modernization. They were asked that how helpful is PSCA in introducing advanced technologies and modernization in Lahore. 94% of the respondents think PSCA is helpful in modernization

Lahore with advanced technologies. However, only 3% citizens responded negatively about it. As a nascent Police organization, this impact on other areas of governance of Lahore is profound. This also confirms that people across the city and across the income groups and educational background understand how PSCA is having a positive impact for the city. Other than many social movements where seeds of change are sown due to long term plans, in this case a technology oriented Policing project of security and public safety is having a positive influence in the governance of the city.

Conclusion:

PSCA is leading in achieving intelligent traffic management, environmental protection, law enforcement and fund generation. According to World Crime Index, in 2016 Lahore ranked at 86 (where number 1 represents the worst) and now in 2020, Its ranked at 280. Similarly Lahore ranked at 70 in 2017 in Traffic Index and in 2020 it's ranked at 106.[9] Crime rates in the city have

[9] (numbeo.com, n.d.)

reduced considerably as a result of the efforts of PSCA in concurrence with other police departments.

Increasing trust of the citizens of Lahore on PSCA is the laudable effort of the department. The 24/7 operational performance of the PSCA lead Lahore in reduction of crime and create courage among people to work with confidence without any fear. Majority of the citizens of Lahore recommended to install more cameras even in streets for the surveillance.

The success of Punjab Safe Cities Authority Lahore is the precursor towards a smart city. It will lead to quality of life and improvement in the overall status of the city as an economic hub and prominent destination for tourists across the world.

References

i. Antonio Cordella, C. B. (October 2012). A public value perspective for ICT enabled public sector reforms: A theoretical reflection .

ii. Asgarkhani, M. (September 2005). Digital government and its effectiveness in public management reform: A local government perspective. Public Management Review 7(3), 465-487.

iii. Glossary of Environment Statistics, Studies in Methods, Series F, No. 67, United Nations, New York, 1997. (2005, December 02). Retrieved from https://stats.oecd.org/glossary/detail.asp?ID=2218

iv. New York. (2014, July 10). un.org. Retrieved from https://www.un.org/en/development/desa/news/population/world-urbanization-prospects-2014.html

v. numbeo.com. (n.d.). Retrieved from https://www.numbeo.com/traffic/rankings.jsp?title=2020

vi. psca. (2015, August 20). psca.gop.pk. Retrieved from https://www.psca.gop.pk/AboutUs/KnowledgeBase

vii. Punjab Safe Cities Authority. (n.d.). Retrieved from https://www.psca.gop.pk/AboutUs/Index

viii. (2019). Safe Cities Index 2019-Urban security and resilience in an interconnected world. The Economist Intelligent Unit Limited 2019.

ix. Seyed Mohammadbagher Jafari, N. A. (January 2011). Exploring the Values of e-Governance to Citizens.

x. thenews.com.pk. (2018, January 24). Retrieved from https://www.thenews.com.pk/latest/272508-lahore-to-be-first-safe-city-of-south-asia-in-2018

xi. uslegal.com. (n.d.). Retrieved from https://definitions.uslegal.com/p/public-safety/

xii. York, N. (2015, July 10). un.org. Retrieved from https://www.un.org/en/development/desa/news/population/world-urbanization-prospects-2014.html

PUBLIC PERCEPTION SURVEY ON SAFE CITY AUTHORITY

Gender a) Male b) Female c) Other

Age
a) 18 - 25
b) 25- 35
c) 35 - 45
d) 45 - 55
e) 55 - 65
f) Above 65

Occupation
a) Employee
b) Businessman
c) Laborer
d) Public Servant
e) Student
f) Other

Education
a) Master / Doctorate
b) Bachelor
c) Junior College / Intermediate
d) High School or below
e) Illiterate

Monthly Household Income
a) Below 25,000 Rs/Month
b) 25,000 – 50,000
c) 50,000 – 75,000
d) 75,00 – 100,000
e) Above 100,000
f) Do not want to mention

Q1. To what extent do you know about Punjab Safe Cities Authority Lahore?
a) Well-known
b) To Some Extent
c) Don't know about it

Q2. Among the following issues, which is the most important for your city?
a) Crime Prevention
b) Public Safety
c) Public Transport
d) Traffic Management
e) Environmental Pollution

Q3. Among the following issues, which is the second most important for your city?
a) Crime Prevention
b) Public Safety
c) Public Transport
d) Traffic Management
e) Environmental Pollution

Q4. How helpful is PSCA in improving quality of life in Lahore?
a) Likert scale

Q5. Is PSCA helpful in reducing street crime from Lahore?
a) Yes If 'yes' then to what extent: 15% - 30% - 45% - ____
b) No
c) No idea about it

Q6. Do you think that the Traffic Management System in Lahore is being improved through Technological Interventions?
a) Yes
b) No
c) Don't Know

Q7. To what extent is Safe City helpful in reducing crime from Lahore?
a) Very Much
b) To some extent
c) Not at all

Q8. Are you satisfied with the 15 system in Lahore?
a) Yes
b) No
c) Don't Know

Q9. Are you satisfied with the E-Challan system in Lahore?
a) Yes
b) No

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c) Don't Know

Q8. From your point of view, why people used to make fake calls on 15 system?

a) For time pass
b) To irritate others
c) Others

Q9. Do you think that travelling on roads is safe in Lahore during day time?

a) Yes
b) No

Q10. Do you think that travelling on roads is safe in Lahore during night time?

a) Yes
b) No

Q11. Do you think that your travel time has been reduced since last one year in Lahore?

a) Yes If 'yes' then to what extent: 15% - 30% - 45% - ____
b) No

Q12. Do you feel more secure with the installation of Cameras in public places?

a) Yes If 'yes' then to what extent: 15% - 30% - 45% - ____
b) No

Q13. To improve security situation, if the Govt. has 10 Crore Rupees; where would they prefer to spend?

a) Policing through Safe City Command Center
b) Policing through Police Stations

Q14. What should be the priority of PSCA

a) Camera & IT initiatives
b) Human Resource Training
c) Integration with Police Stations

Q15. Do you think that PSCA is helping to introduce advanced technologies and modernization in Lahore?

a) Helpful
b) To Some Extent
c) Not Helpful
d) No idea about it

Consent Form: I hereby confirm that I have participated in this survey with my own consent and for which I am not paid. I understand that finding of this survey can be used for publications but my participation will be anonymous. This survey will be used by the researchers and Safe Cities Authority for research and public policy purposes and only 18 years and above aged persons can participate in it. My responses cannot be withdrawn after signing of this consent form.

Investigators:

- Mr. Akbar Nasir Khan, COO/DIG Punjab Safe Cities Authority
- Dr. Syed M Hasan, Assistant Professor, Department of Economics, LUMS

Research Team:

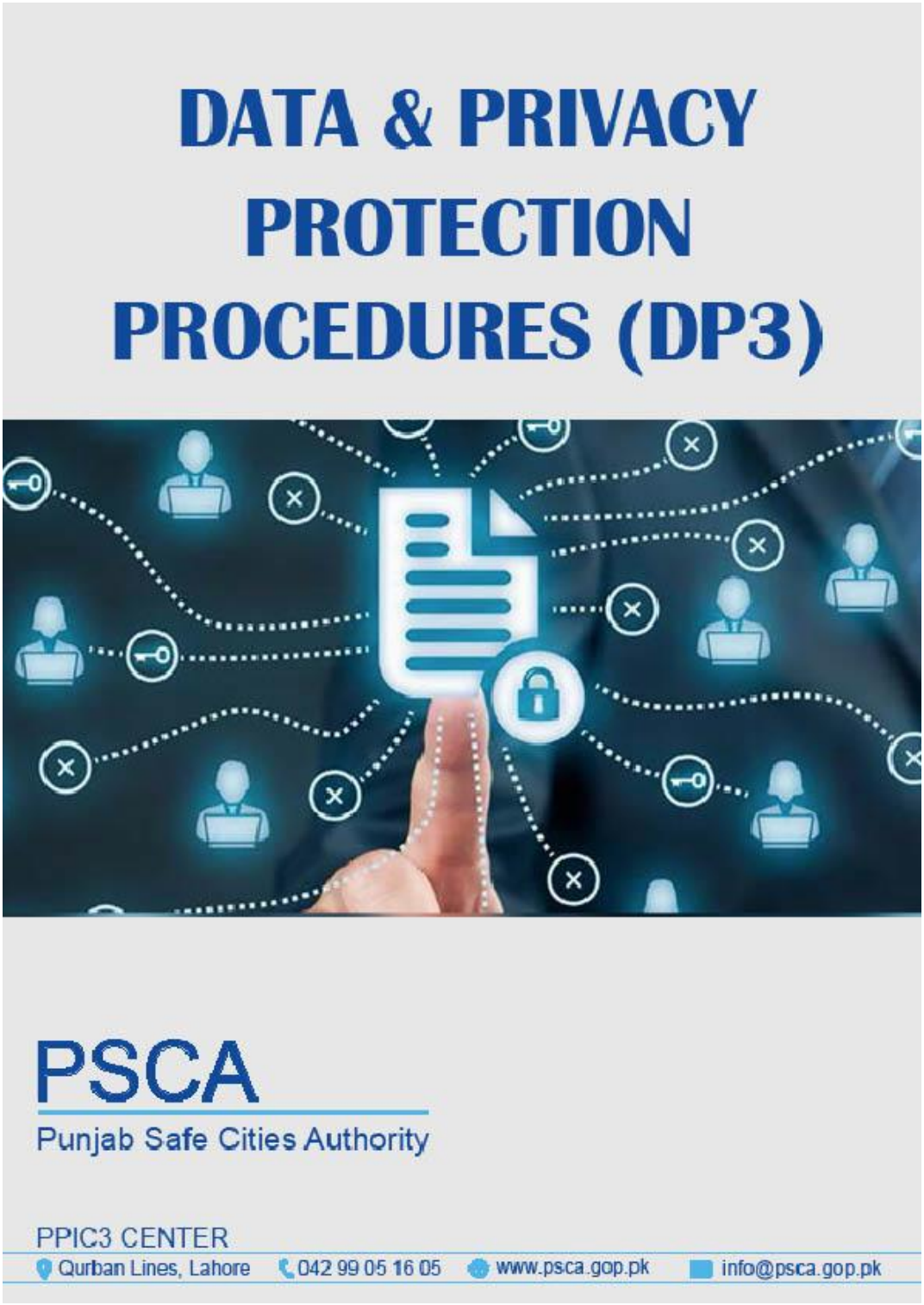
- Fakhra Irshad
- Areeba Butt

Enumerators:

- Ahmad Khan
- Muhammad Imran
- Hamza Saleem
- Zohaib Munawwar
- Raheel Irshad
- Atif Zaman

Annexure – XVII

PSCA Data & Privacy Protection Procedures (DP3)



BACKGROUND:

The protection of natural person in relating to the processing of personal data is a fundamental right, which is enshrined in the Article 14 (1) of the Constitution of Pakistan Islamic Republic of Pakistan 1973 [1]. It is, therefore, necessary for security institutions like Punjab Safe Cities Authority to have a well-defined Data and Privacy Protection Procedures (DP3) which have detailed guidelines for users and recipients of PSCA data. It becomes more critical because it has repercussions for multiple stakeholders involved in the process.

Punjab Safe Cities Authority has to meet requirements of law enforcement agencies as well as protecting the data being generated, gathered or stored and shared with lawful authorities not only for safety and security while duly protecting the rights of the persons who are involved and subjects of this data. In this age of digitalization, personal data of any person can easily be misused, modified and shared for criminal or other malicious purposes. Data should be secured according to the designated parameters and not shared internally or externally without prior approval of courts or competent authority with a due process. These DP3 are subjected to changes implemented from time to time and made available to all publicly.

1. INTRODUCTION:

In 2016, through a consultative process, PSCA requested the Federal Government of Pakistan, through Government of the Punjab, to address the issue of admissibility of the evidence collected through electronic device in all cases of criminal law. Following this, as a Part of Punjab Police, it has a constitutional obligation to protect the citizens of Pakistan and in Punjab, therefor, PSCA has introduced for the first time in Pakistan, Data Protection and Privacy Procedures (DP3) with guidelines since 2016. Subsequently These were implemented to harmonies the protection of fundamental rights and freedom of the natural person in respect of processing data generated and maintained by PSCA, that is in line with the following legal instruments:

[1] Part II, Fundamental Rights and Principles of Policies, Constitution of Islamic Republic of Pakistan, 1973

1. Article 14(1) of The Constitution of the Islamic Republic of Pakistan 1973 [2]
2. The Prevention of Electronic Crimes Act (PECA) 2016 [3]
3. Convention on the Rights of the Child [4]
4. International Covenant on Civil and Political Rights (ICCPR) [5]
5. Pakistan Penal Code 1860 [6]
6. General Data Protection Regulation (GDPR) 2016/679 of European Union [7]
7. PSCA Electronic Data Regulations 2016 [8]
8. Cairo Declaration on Human Rights in Islam 1990 (CDHRI) [9]
9. The Investigation of Fair Trial 2013 [10]
10. Any other relevant framework applicable from time to time

[2] The Article deals with the dignity of man and, the privacy of home subject to law, shall be inviolable.

[3] PECA 2016 is promulgated to prevent unauthorized acts such as electronic forgery & fraud, cybercrime, hate speech, child pornography, spamming, spoofing and provide mechanism for their investigation, prosecution and trial.

[4] To recognize the special care and assistance to the child because of his physical & mental immaturity and to grownup in a family environmental, atmosphere of happiness, love and to live an independent life including appropriate legal protection before as well as after birth

[5] Defines & includes the inherent dignity of human person, the idea of free human being to enjoying civil & political freedom and to safeguard his economic, social and cultural rights.

[6] Section 509, of Pakistan Penal Code defines insulting modesty or casing harassment, section 499 of PPC define defamation, section 268 of PPC ie that is public nuisance and section 409 of PPC defines Criminal breach of trust by public servant, or by banker, merchant or agent and in case of approve the guilt punishment for life & fine may be awarded to the culprits.

[7] Free data within European Union not restricted nor prohibited for reason to connect with the protection of natural persons with regard to the processing of personal data

[8] PSCA since its inception is mindful of the privacy concerns and has adopted a process how to collect evidence/data from PPIC3/PSCA and to whom this data/evidence may be provided for investigation, enquiry and trial keeping in mind present requirements, human rights framework and international obligations of the state from Privacy perspective. PSCA also recommended in 2018 to expand the scope of concept of Privacy from home to public places as well.

[9] CDHRI reaffirms that all human beings are from one family without any discrimination on the ground of race, color, language, sex, religious belief and the life is God-given gifted. The struggle to protect a person from exploitation, prosecution, and to affirm his freedom and right to a dignified life witch are contained in the Revealed Books of Allah should be thorough

[10] Investigation for collection of evidence by means of modern techniques and devices to prevent and effectively deal with scheduled offences and prohibition of misuse of interception material.

2. OBJECTIVES:

These DP3 and guidelines, primarily, are conceived and implemented:

I. To protect Privacy rights of the people through PSCA systems;
II. To secure the data of natural person and events collected and maintained by PSCA for security and public safety purposes;
III. To maintain the integrity of the Evidence/data being delivered to honorable Court/Forum or on their direction to any person and to Law Enforcement Agencies (LEA) through PSCA infrastructure;
IV. To retain, preserve, store and destroy the electronic data gathered/collected through electronic devices of PPIC3/PSCA and its provision protocols to Law Enforcement Agencies/Courts/Tribunals / Investigating officers etc.;
V. To retain, preserve, store and destroy the electronic data gathered/collected through electronic devices of PPIC3/PSCA and its provision protocols to Law Enforcement Agencies/Courts/Tribunals / Investigating officers etc.;

3. INSTALLATION OF SURVEILLANCE NETWORK/SENSORS BY PSCA:

I. PSCA cameras and sensors will not be installed in any place which may affect the protection of Privacy rights of the people in public or private without due process and authorization.
II. PSCA cameras and sensors shall only be placed at public places or any other place directed by the Government/Authority.
III. PSCA cameras and sensors shall be placed at conspicuous places so people can observe and remain informed about the presence of such equipment.
IV. Presence of cameras and sensors in Punjab shall be publicly shared in order to maintain deterrence and privacy rights of public to the best possible extent without compromising requirement of the law enforcement agencies and PSCA.
V. Data obtained through any cameras and sensors and equipment shall be used only as per the guidelines of the Authority including the instructions contained in this policy and procedures.

4. PSCA'S DATA USERS GUIDELINES:

I. Only authorized persons and entities can access, view, listen, use, alter, copy, transfer, publish and/or obtain data from PSCA through a lawful process.
II. Stored/gathered data shall be shared with only authorized person internally or externally.
III. Investigation Officers or representative of any security agency can only access, listen or view data of an incident by visiting PSCA with prior approval and after following due process.
IV. No data from PSCA shall be shared without watermarks and clear identification for tracking back the data and the process.
V. No Officer/user at PSCA shall be allowed to store any data in any unauthorized manner or unauthorized purpose.
VI. No data shall be shared with any LEA or Court in such arrangement, which may lead to further use or disseminate easily.
VII. An approved Electronic Data Analysis procedure shall be followed for sharing any data to any LEA or Court.
VIII. Data shall not be managed or handled by any person who is not provided sufficient training and have requisite knowledge about the Standing Operating Procedures and lawful requirement about Electronic Data Regulations.
IX. Data including live feed shall not be shared with any other organization without lawful permission and processes in order to secure the fundamental privacy rights of citizens and for sanctity of evidential value of the data.
X. A person who is reasonably found to misuse his/her rights and authorizations of data handling, protection, transfer or custodian of any data shall be liable for any civil and/or criminal consequences as per law by the Authority.

5: Data Handling Procedure:

I. All users of PSCA data, whether collected through PSCA infrastructure or disseminated through the systems, including social and electronic media, shall adhere to DP3.

II. PSCA/PPIC3 Officers/officials or any other authorized/allowed person (Officers) shall not deliberately record any act of natural person at a public place or inside any vehicle infringing their right of privacy unless there is reasonable reason to believe that they are committing or attempt to committing any offence.

III. Officers shall remain very careful while gathering any data of Women and Children.

IV. Officers shall not use or store any data in their personal devices otherwise in accordance with the directions of competent authority.

V. Officers shall not monitor any personal space of citizen unless necessary and proportionate to their lawful requirements.

VI. Officers shall not disseminate/publicize any objectionable pictures/videos of persons in any form through any medium which may infringe upon the rights of persons involved in the pictures/videos.

VII. Track record of accessing data is maintained by all the employees of PPIC3/PSCA deputed as operators.

VIII. Any violation of DP3 will be considered as misconduct, as per Service Regulations 2017 of PSCA and disciplinary action shall be taken against any officer/employee found violating these obligations.

IX. Without prejudice to any other civil or criminal legal consequence, contract of operators may be terminated due to violations of DP3.

6: Data Sharing Terms & Conditions:

I. This Electronic Data Application Form is available free of cost and can be accessed and downloaded from Authority's official website www.psca.gov.pk.

II. A request for electronic evidence is made for the purposes of, providing evidence in criminal, civil, family or any Court/Tribunal proceedings, prevention & reduction of crime & disorder, investigation and detection of crime, identification of witnesses and other lawful purposes.

III. The Applicant shall apply for the delivery of electronic data based on reliable/trustworthy details as mentioned in the application form.
IV. The details given in the application form by the applicant should be correct, accurate and best to the knowledge of the applicant in its official capacity.
V. The applicant shall be liable for any misstatement, false data or concealment, for obtaining electronic data.
VI. The applicant shall affirm that he/she has requested for electronic data in official capacity and for lawful purpose.
VII. The electronic data should only be used for the purpose and scope mentioned in the application form, and received data could not be used for any other purpose.
VIII. The Applicant shall be responsible for any damage/loss/tempering to the electronic data/Electronic Data Storage Device after receiving evidence in electronic form i.e. USB Storage/other medium.
IX. The Applicant shall take all necessary measures for protection of data/electronic evidence and to submit in the court as a primary evidence.
X. The Applicant shall only be able to view the content of the Electronic Data in the premises of IC3 center after due process before its delivery to the Applicant.
XI. It shall be the responsibility of the Applicant to store in safe custody the received Electronic Data Storage Device in its original form and its further transmission to the court for further legal procedure.

XII. The Applicant shall be liable for any tempering/edition/deletion of the content after its delivery to the Applicant.
XIII. The Electronic Data shall be an admissible piece of evidence in the court of law/competent forum and is governed by the provisions of PSCA Electronic Data Regulations 2016 along with other enabling provisions of applicable law(s).
XIV. The Applicant shall ensure security of Electronic Data Storage Device, USB storage/other medium issued to the applicant and follow every procedural, security and other requirement as specified by the authority.
XV. The Authority may charge a fee on issuance of Electronic Data and the USB Storage/Other medium and other related equipment and services.
XVI. The Authority shall provide expert assistance to the applicant and to the Court in regards to the technical matters related to the Electronic Data.
XVII. The Video/Audio/Image/Electronic Data shall be provided in its original form.
XVIII. The content shall be given in original form. The content contained in the USB Storage/Other Medium shall be the true form of the original Video/Audio/Image stored on the main data center of IC3 center(s) after due watermarking.
XIX. The Electronic Data shall be saved for 30 days after it is stored/transmitted/provided/sent/made available in Electronic Data Storage and delivered/handed

over to the investigation officer or presented to the court.

XX. Electronic Evidence already stored/preserved may be saved up-to 7 years, if the Authority is satisfied that the information/video/audio/sound/pictures are required to be stored till such time,

XXI. The applicant shall officially inform about the final decision of the court/tribunal/competent authority in regards the abovementioned incident in which the data/evidence delivered to him. In case the data is no more required, it shall be deleted from the storage of IC3 center.

XXII. The Application can only be made within 30 days of the incident/occurrence or as specified by any court of law.

XXIII. Copyright and ownership of all material recorded by virtue of the electronic system shall remain with the Authority and IC3 data center.

XXIV. Authority can be contacted at support.evidence@psca.gop.pk for further assistance or related information.

Note:

These DP3 guidelines are issued to ensure that lawful operations of safety and security by PSCA officer, men and women, are executed keeping in mind the fundamental Human rights regime of the country without compromising security and privacy perspectives.

Notwithstanding the forgoing, PSCA reserves the right to revise, revoke, or amend this policy from time to time.

Join us for Data & Privacy Protection:

If you have any suggestions or you notice any violation of DP3, please inform us through email Privacy.Protection@psca.gop.pk or call 15 for complaint.

PPIC3 CENTER
Qurban Lines, Lahore Pakistan

www.psca.gop.pk 042 990 456 05 info@.psca.gop.pk

@punjabsafecities @PSCAsafecities

Annexure - XVIII

Invitation Letter

Study Title: Public Preferences on the trade-off between privacy and surveillance in Public spaces

Dear Participant

I would like to invite you to participate in a research study if your age is more than 18 years. Your participation to this survey is voluntary and can be withdrawn during the survey completion here in person. The answers you give here will be used for research purposes only and your participation will be anonymous

My name is Akbar Nasir Khan, age 47, and currently as a part of a self-funded research for my Doctorate in Business Administration (DBA) from Portsmouth University, UK. I am conducting a survey in two big cities of Punjab (Multan and Rawalpindi), to gauge individual preferences regarding trade-offs between privacy and surveillance in the scenario of a surveillance programme which also include installation of CCTV cameras in big cities of the province. Please note that Public preferences for the security measures covered by the attributes and their levels presented here represent **future** scenarios.

This survey is conducted by Urbane (Smart City Solutions and Research Company) on my behalf and you have been identified that you might be a suitable participant in my research (**Public Preferences on the trade-off between privacy and surveillance in Public spaces)** and we will not ask for your name, address or personal details. You may wish to provide socio-demographic information about yourself.

Thank you in advance for agreeing to participate in this survey. Your cooperation is valuable for the completion of this research and your answers

will be treated as confidential and will not be released to anyone except for academic purposes which may include publications.

Questions and queries

If you want to find out more about the survey in general, please address any questions to:UP831511@myport.ac.uk

The survey questions are provided in English.

Annexure - XIX

Consent Form

Title of Study: Public Preferences on the trade-off between privacy and surveillance in Public spaces

Name and Contact Details of Researcher(s): Akbar Nasir Khan (UP831511@myport.ac.uk)

University Data Protection Officer: data-protection@port.ac.uk

Ethics Committee Reference Number: (Awaited)

1. I confirm that I have read and understood the Research Questionnaire. ☐

for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

2. I understand that my participation is voluntary and that I am free to withdraw at any time during this data collection without giving any reason. ☐
3. I understand that data collected during this study will be processed in accordance with data protection law as explained in the Invitation Letter (Version 3) ☐
4. I understand that the results of this study may be published and / or presented at meetings or academic conferences, and may be provided to research journals/*Public Policy experts*. I give my permission for my anonymous data, which does not identify me, to be disseminated in this way. ☐
5. I agree to take part in the above study. ☐
6. I have received one copy of this Consent Form. ☐

Name of Participant: Date: Signature:

Name of Person taking Consent: Date: Signature:

Form Reference No.

(In case of any queries by the Participants at later stage for any issues including withdrawal)

Annexure - XX

Questionnaire

Public Preferences on the trade-off between privacy and surveillance in Public spaces

Introduction

As part of a self-funded research for my Doctorate in Business Administration (DBA) from Portsmouth University, UK, I am conducting a survey in two big cities of Punjab, the largest province of Pakistan, to gauge individual preferences regarding tradeoff between privacy and surveillance in the scenario of a surveillance programme which also include installation of CCTV cameras in big cities of the province.

The current research is conducted purely for academic purposes and the empirical findings will not be used for commercial purposes. Individual responses will be kept strictly confidential and anonymous.

For any questions and information about this survey, please feel free to contact me at up831511@myport.ac.uk

PART 1

Area of residence?	
1.	Multan (South of Punjab)
2.	Rawalpindi (North of Punjab)
3.	Prefer not to say
Gender	
1.	Male
2.	Female
3.	Prefer not to say
Age in years?	
1.	18–25
2.	26–40
3.	41–55
4.	56 or above
5.	Prefer not to say
Academic Qualifications?	
1.	Upto Matriculation
2.	Upto O-level
3.	FA- FSc/A-Level
4.	Graduate or above
5.	Prefer not to say
Employment Status?	

1.	Employed
2.	Unemployed
3.	Studying
4.	Business Person
5.	Prefer not to say
Approximate Monthly Income in Rupees	
1.	15,000 -40,000
2.	40,001 - 65,000
3.	65,001 - 90,000
4.	90,001 or above
5.	Prefer not to say

Part 2. Surveillance Programme in the City

Imagine a public sector organisation is planning to install CCTV cameras in your city. These Cameras will be used for multiple purposes but main objective is reduction of crime and improvement of traffic flows.

It is important to know that in addition to providing security and improving public safety, these CCTV cameras, may affect your privacy in public spaces in different ways as your movement and vehicles will also be monitored through these cameras. The information collected will be used to act on suspicious activities, to prevent crimes before happening and in investigations in post crime situations. In this scenario please consider the following options in the following situations and share your preferences:

2. Proposed number of Cameras in the City

The number of cameras will be required to cover the major public roads, entry exit points, road crossings and areas and where people visit for daily routine.

i. No Cameras
ii. 0-2000 Cameras
iii. 2001 - 4000 Cameras
iv. 4000 or more Cameras

3. Types of Cameras installed in the city

It will be important to determine what is the function of each camera is and this will inform about selectin of the cameras. If you want to track and detect people and vehicles, then you need sophisticated cameras.

i. Standard CCTV Cameras
ii. Vehicle Number Plate Recognition Cameras
iii. Facial Recognition Cameras
iv. Vehicle Number Plate Recognition and Facial Recognition Cameras

4. Probability of Preventive action taken against suspicious activity BEFORE any incident/potential crime by Police with the help of CCTV cameras

By monitoring through cameras, Police may be able to detect violations of laws and suspicious activities or illegal acts of the people/vehicle e.g. drug users or over speeding or illegal number plates on vehicles etc.

i. 0 - 25 preventive actions or observation/day
ii. 26-50 preventive actions or observation/day
iii. 51-75 preventive actions or observation/day
iv. More than 75 preventive actions or observation/day

5. Percentage of crimes/cases resolved AFTER the crime/incidents by Police with the help of CCTV cameras every month

After an incident or crime, footage of CCTV cameras may be used to detect the reasons and provide evidence to the court for resolving the case.

i. 0 - 5% per month
ii. 6 - 10% per month
iii. 11 - 15% per month
iv. More than 15% per month

6. Public will be exposed to all surveillance as people may be observed through CCTV cameras daily

Privacy of individuals may be reduced in public spaces due to CCTV cameras as a common person shall also be observed through these cameras every day and Public information is important for presence of surveillance programme for deterrence and creating a sense of security and caution for the people.

i. 0 - 10 times a day
ii. 11- 15 times a day
iii. 16 - 20 times a day

iv. More than 20 times a day

7. Annual reduction in crime by surveillance through CCTV cameras

The programme may help in reduction of crime taking place in public sphere or otherwise and public perception may change that security situation has improved in the city through use of such a programme.

i. 05 - 10%
ii. 11 - 15%
iii. 16 - 20%
iv. More than 20%

8. Annual *Security Fee* from residents of the city may be charged for programme

In order to ensure public participation and for maintenance of the programme, annual security fee shall be charged from the residents who will be permanent beneficiaries of crime reduction and improvement in the public safety in their city.

i. No Fee from residents
ii. 500 - 1000 Rupee/Year
iii. 1001 - 2000 Rupee/Year
iv. More than 2001 Rupee/Year

Stated Choice Scenarios (8)

Please indicate your choices in the following situations:

1. Are the choices clear to you and you can compare them?

i. Yes
ii. No

2. Do you know the difference between various cameras and their functions?

i. Yes
ii. No

3. Do you think the levels of choices are reasonable and close to reality?

i. Yes
ii. No

4. Do you understand the characteristics mentioned in the survey?

i. Yes
ii. No

5. Which of the Characteristics was not clear to you?

i. Number of Cameras to be installed in the City
ii. Types of Cameras in the city
iii. Probability of preventive action taken against suspicious activity BEFORE any incident/potential crime by Police with the help of CCTV cameras
iv. Percentage of crimes/cases resolved AFTER the crime/incidents by Police with the help of CCTV cameras
v. Public will be exposed to all surveillance as people may be observed through CCTV cameras daily
vi. Annual reduction in crime by surveillance through CCTV cameras
vii. Annual Security Fee from residents of the city may be charged for programme

6. Which characteristics was most important for you?

i. Number of Cameras to be installed in the City
ii. Types of Cameras in the city
iii. Probability of preventive action taken against suspicious activity BEFORE any incident/potential crime by Police with the help of CCTV cameras
iv. Percentage of crimes/cases resolved AFTER the crime/incidents by Police with the help of CCTV cameras
v. Public will be exposed to all surveillance as people may be observed through CCTV cameras daily
vi. Annual reduction in crime by surveillance through CCTV cameras
vii. Annual Security Fee from residents of the city may be charged for programme

7. Which characteristics was Second most important for you?

i. Number of Cameras to be installed in the City
ii. Types of Cameras in the city
iii. Probability of preventive action taken against suspicious activity BEFORE any incident/potential crime by Police with the help of CCTV cameras
iv. Percentage of crimes/cases resolved AFTER the crime/incidents by Police with the help of CCTV cameras
v. Public will be exposed to all surveillance as people may be observed through CCTV cameras daily
vi. Annual reduction in crime by surveillance through CCTV cameras
vii. Annual Security Fee from residents of the city may be charged for programme

8. Which characteristics was least important for you?

i. Number of Cameras to be installed in the City
ii. Types of Cameras in the city
iii. Probability of preventive action taken against suspicious activity BEFORE any incident/potential crime by Police with the help of CCTV cameras

iv. Percentage of crimes/cases resolved AFTER the crime/incidents by Police with the help of CCTV cameras
v. Public will be exposed to all surveillance as people may be observed through CCTV cameras daily
vi. Annual reduction in crime by surveillance through CCTV cameras
vii. Annual Security Fee from residents of the city may be charged for programme

Definition of Attributes and Levels

No.	Attributes	Levels
1	No. of Cameras to be installed in the city	i. No Cameras
		ii. 0-2000 Cameras
		iii. 2001 - 4000 Cameras
		iv. More than 4000 Cameras
2	Types of Cameras in the city	i. Standard CCTV Cameras
		ii. Vehicle Number Plate Recognition Cameras
		iii. Facial Recognition Cameras
		iv. Vehicle Number Plate and Facial Recognition Cameras
3	Preventive Actions taken through Cameras BEFORE incident	i. 0 - 25 preventive actions /day
		ii. 26-50 preventive actions /day
		iii. 51-75 preventive actions /day
		iv. More than 75 preventive actions /day
4	AFTER the crime/event assistance provided by Cameras every month	i. 0 - 5% per month
		ii. 6 - 10% per month
		iii. 11 - 15% per month
		iv. More than 15% per month

5	Public exposure of people through the cameras everyday	i. 0 - 10 times a day
		ii. 11- 15 times a day
		iii. 16 - 20 times a day
		iv. More than 20 times a day
6	Expected annual reduction in %age crime	i. 05 - 10% per year
		ii. 11 - 15% per year
		iii. 16 - 20% per year
		iv. More than 20% per year
7	Annual Security Fee	i. No Fee from residents
		ii. 500 - 1000 Rupee/Year
		iii. 1001 - 2000 Rupee/Year
		iv. More than 2000 Rupee/Year

Annexure – XXI

Graphical Layout of Survey Responses

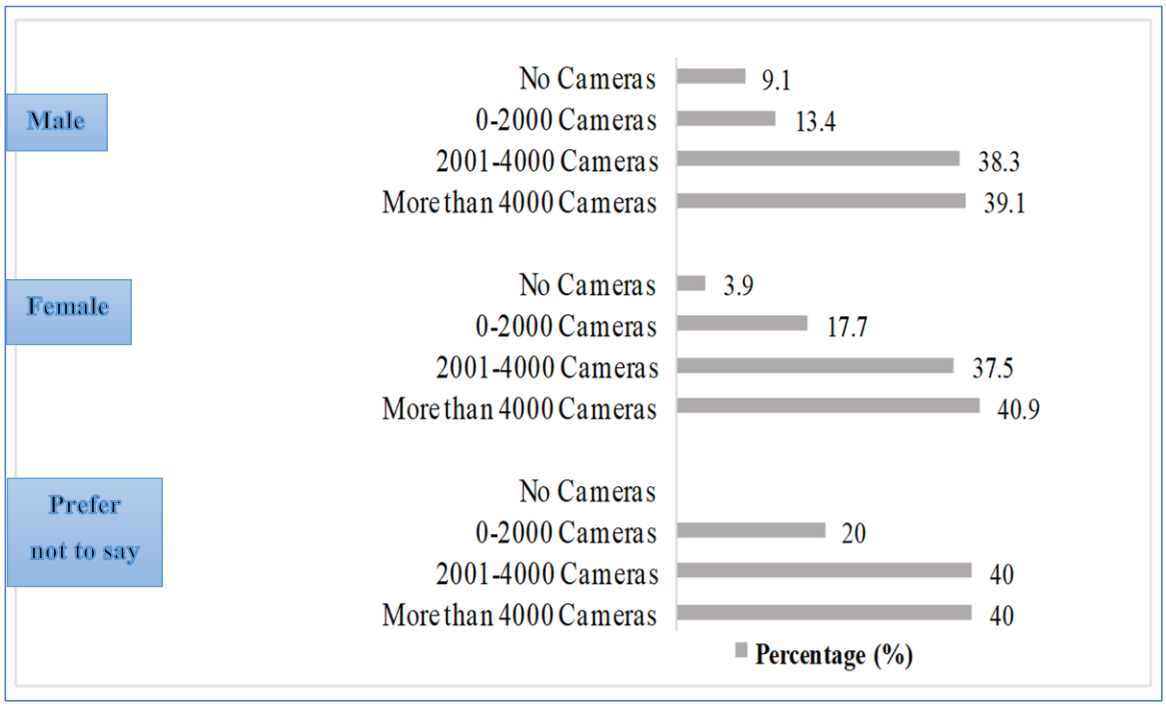


Chart 14. Proposed Number of Cameras (Rwp)

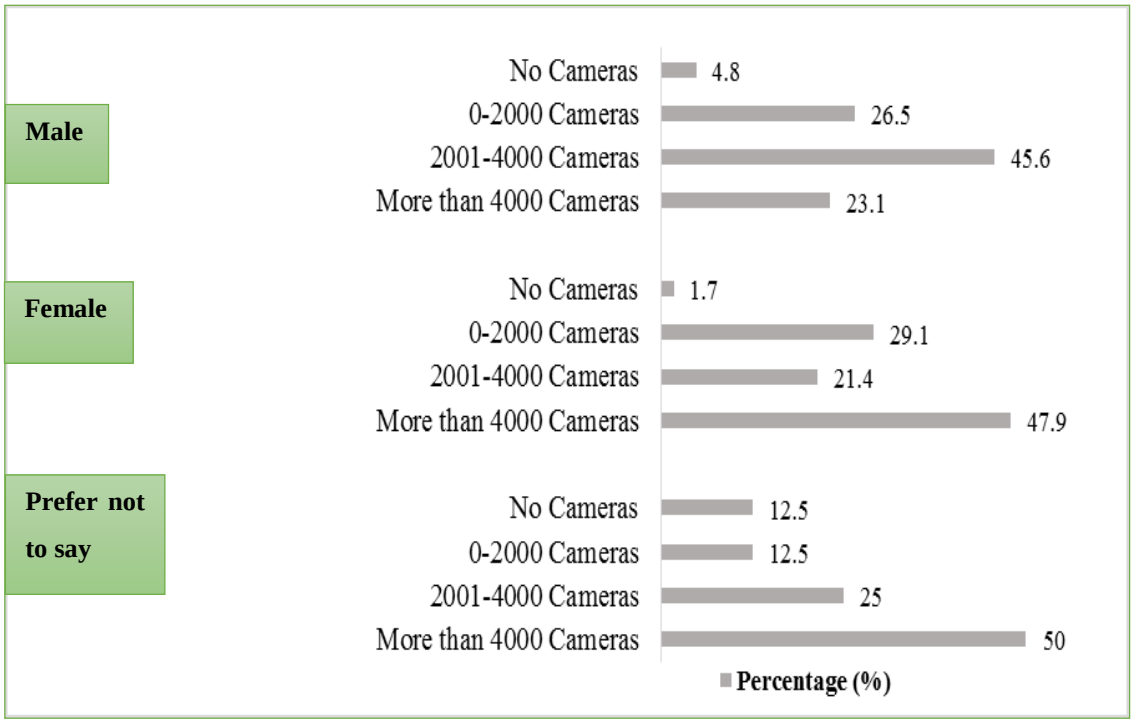


Chart 15. Proposed Number of Cameras (Mlt)

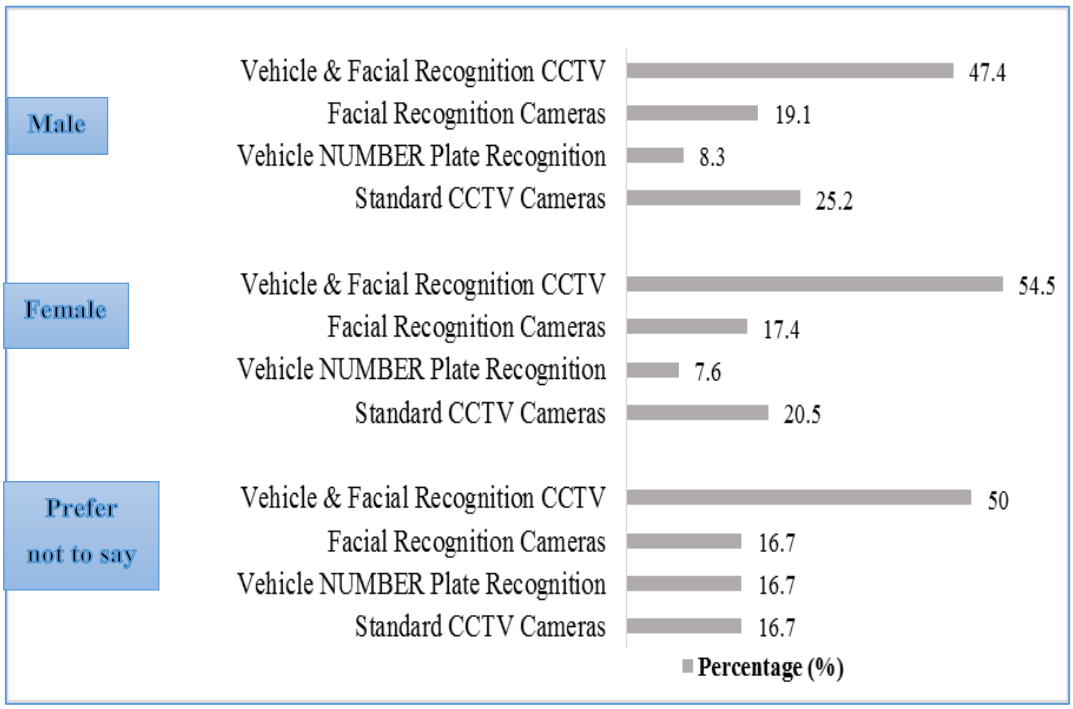


Chart 16. Types of Cameras (Rwp)

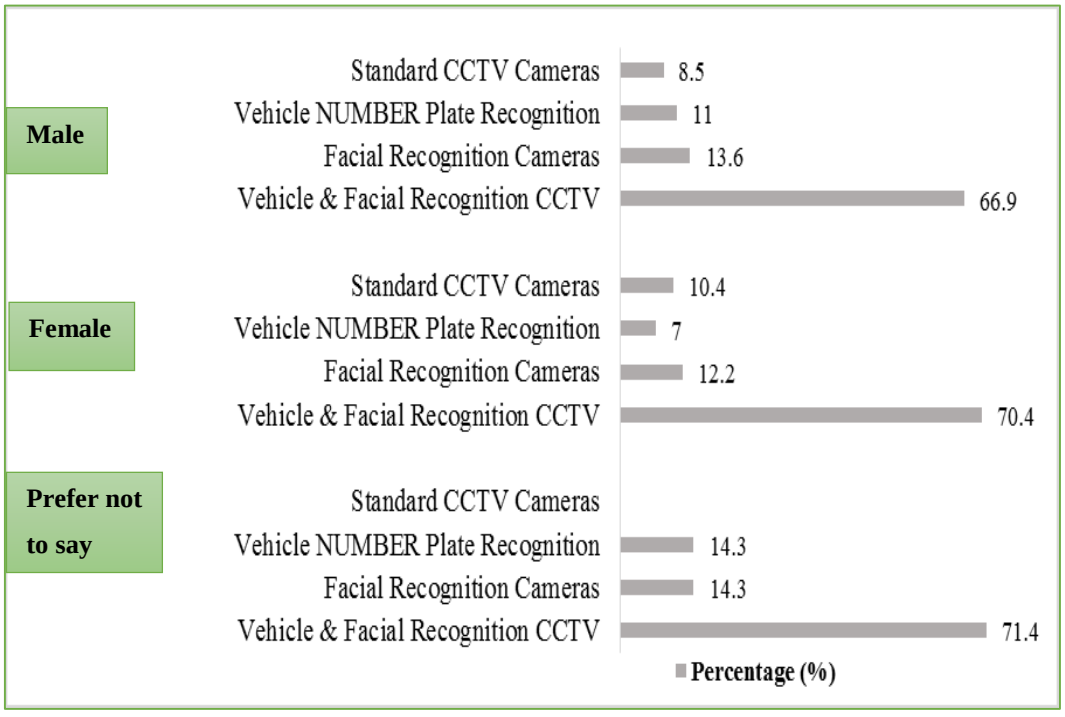


Chart 17. Types of Cameras (Mlt)

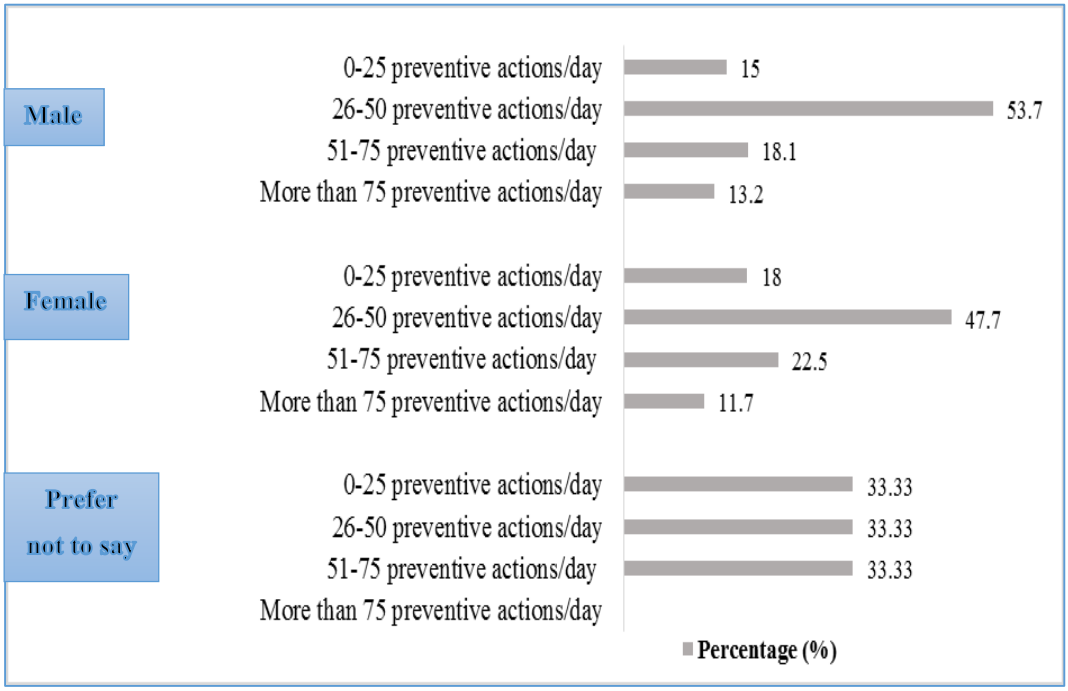


Chart 18. Probability of Preventive Action taken against suspicious activity BEFORE any incident/potential crime by Police with the help of CCTV cameras (Rwp)

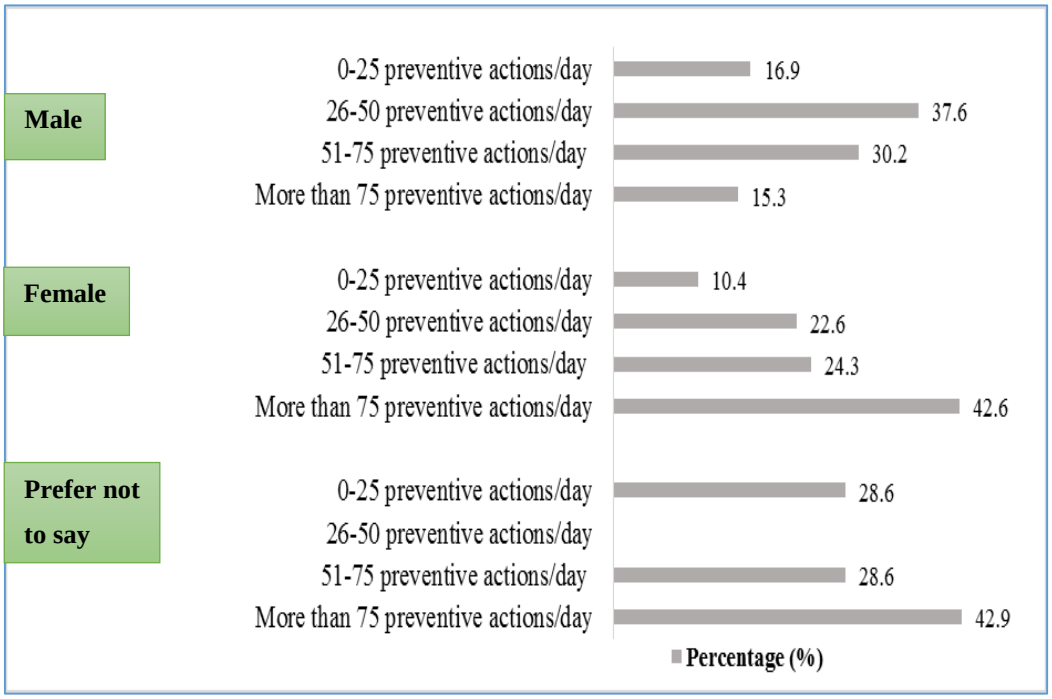


Chart 19. Probability of Preventive Action taken against suspicious activity BEFORE any incident/potential crime by Police with the help of CCTV cameras (Mlt)

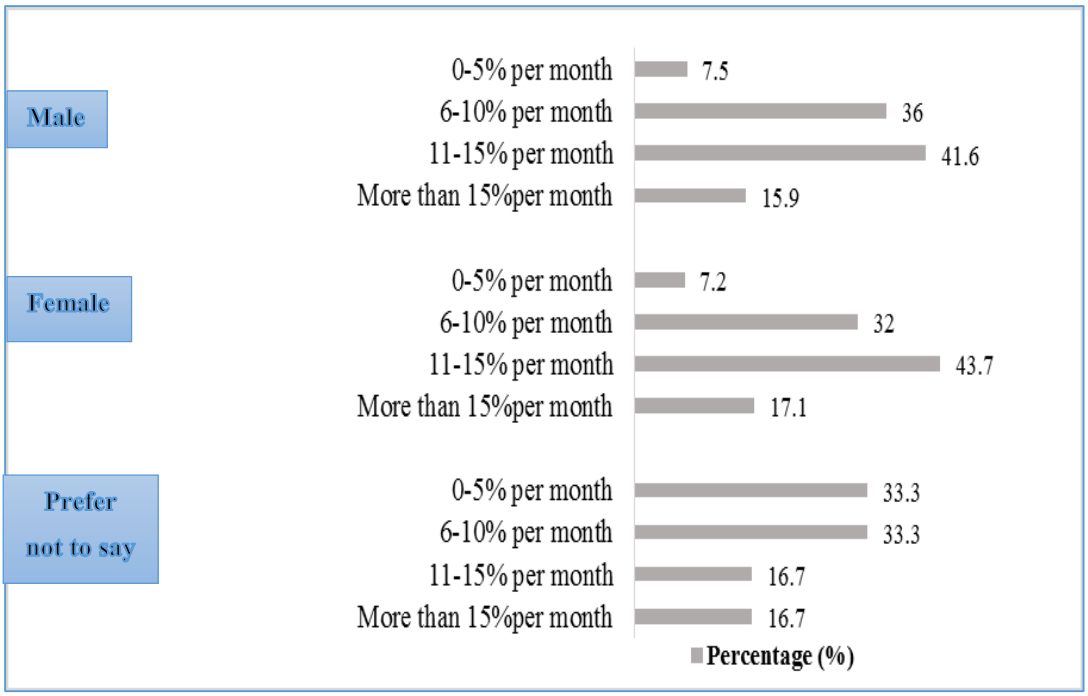


Chart 20. Percentage of crime/cases resolved AFTER the crime/incidents by Police with the help of CCTV cameras every month (Rwp)

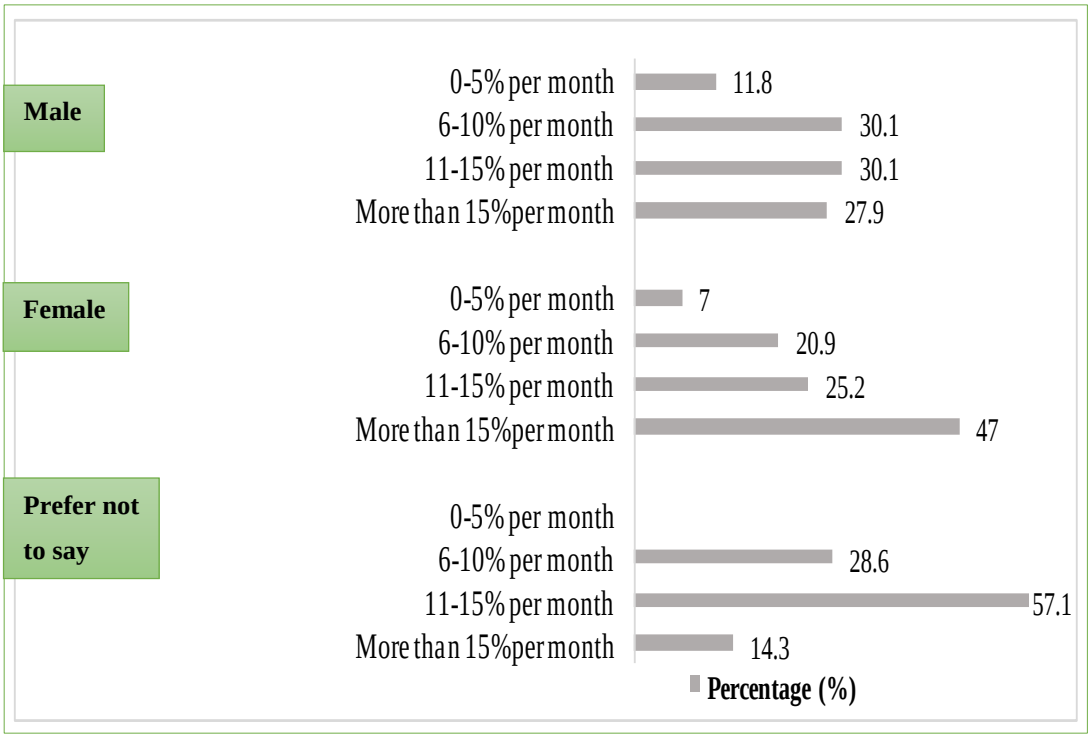


Chart 21. Percentage of crime/cases resolved AFTER the crime/incidents by Police with the help of CCTV cameras every month (Mlt)

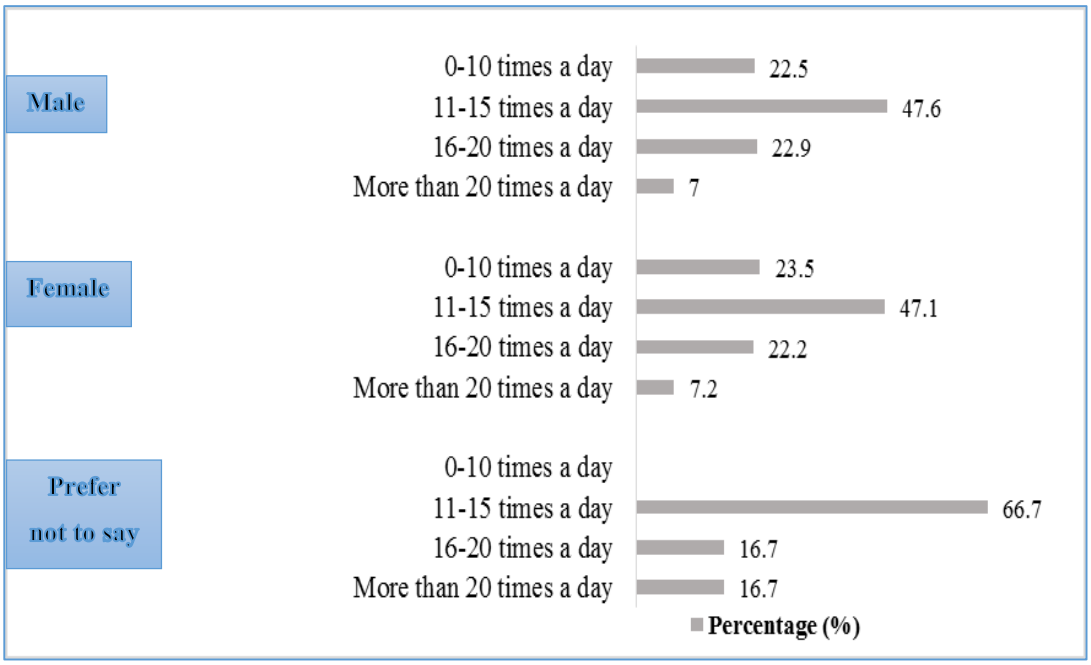


Chart 22. Public will be exposed to all surveillance as individuals may be observed through CCTV cameras daily (Rwp)

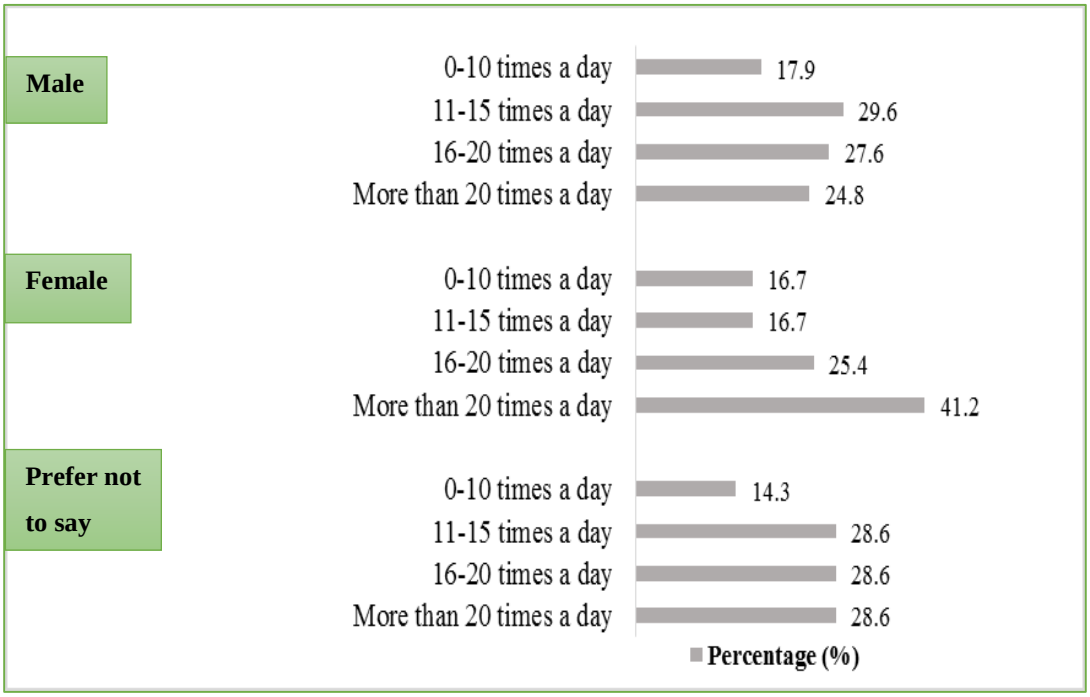


Chart 23. Public will be exposed to all surveillance as individuals may be observed through CCTV cameras daily (Mlt)

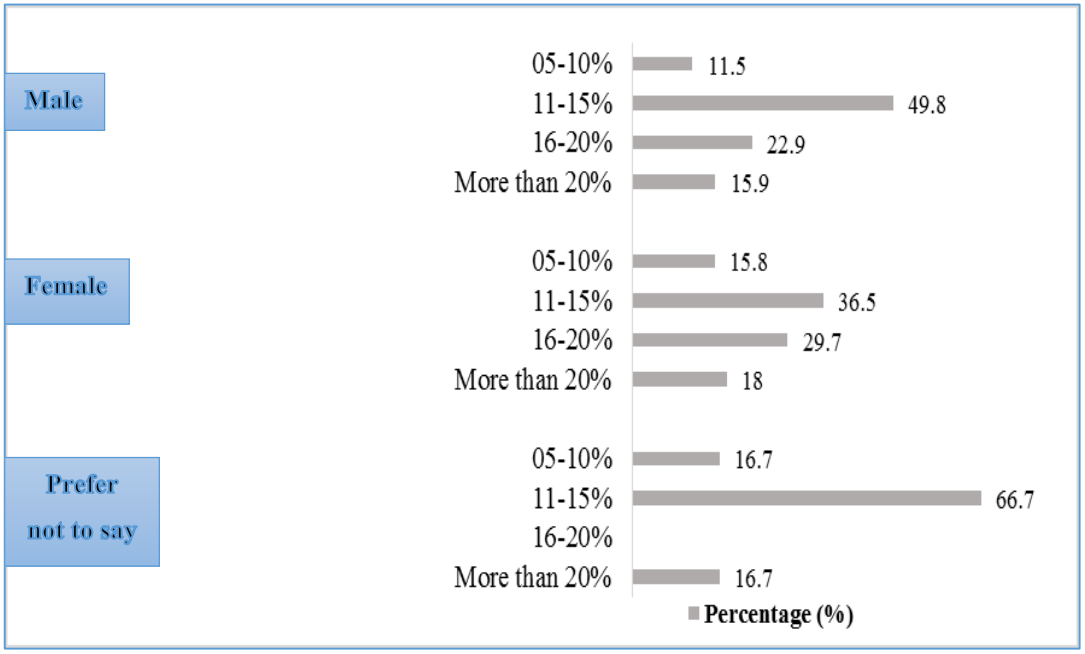


Chart 24. Annual reduction in crime by surveillance through CCTV cameras *(Rwp)*

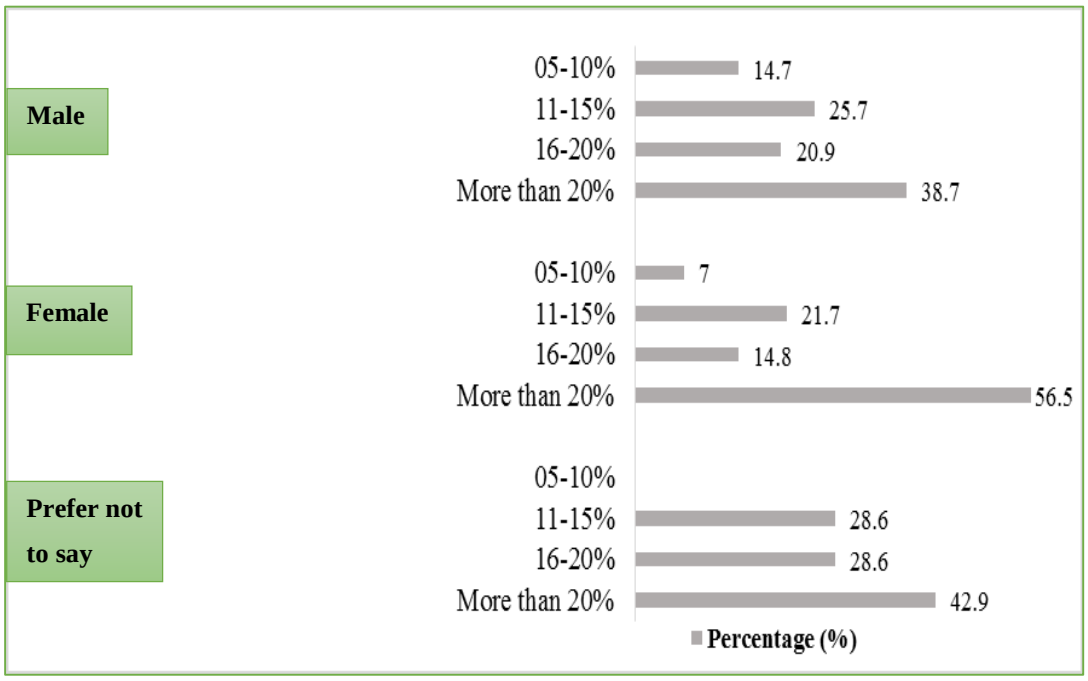


Chart 25. Annual reduction in crime by surveillance through CCTV cameras (Mlt)

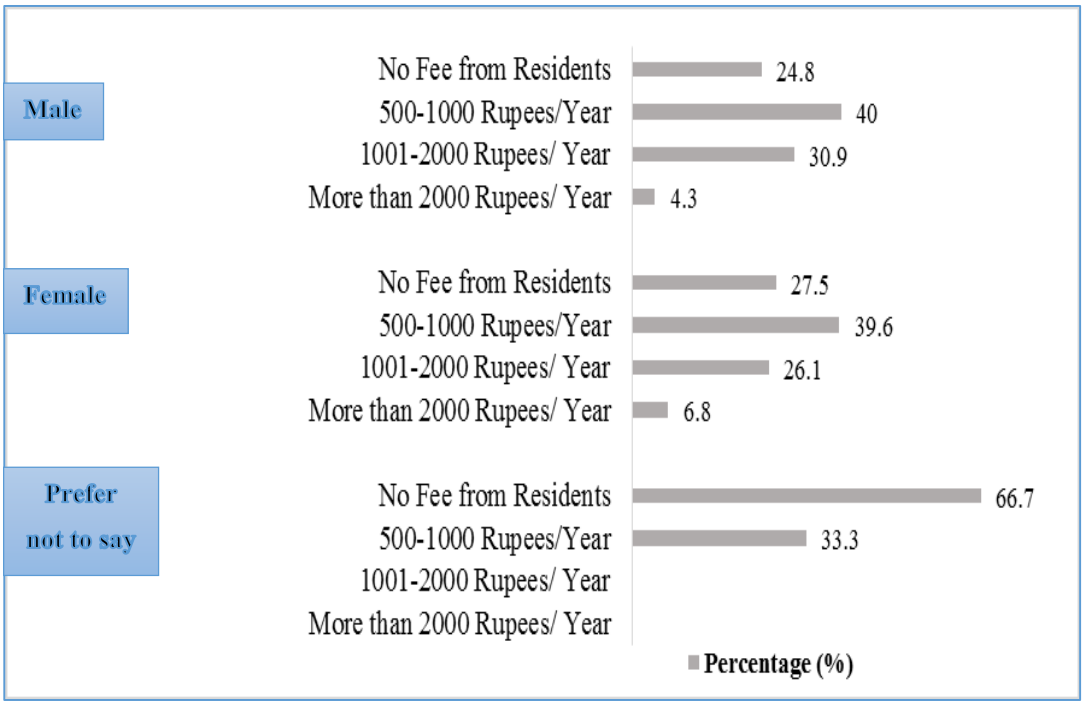


Chart 26. Annual Security Fee from residents of the city may be charged for the programme (Rwp)

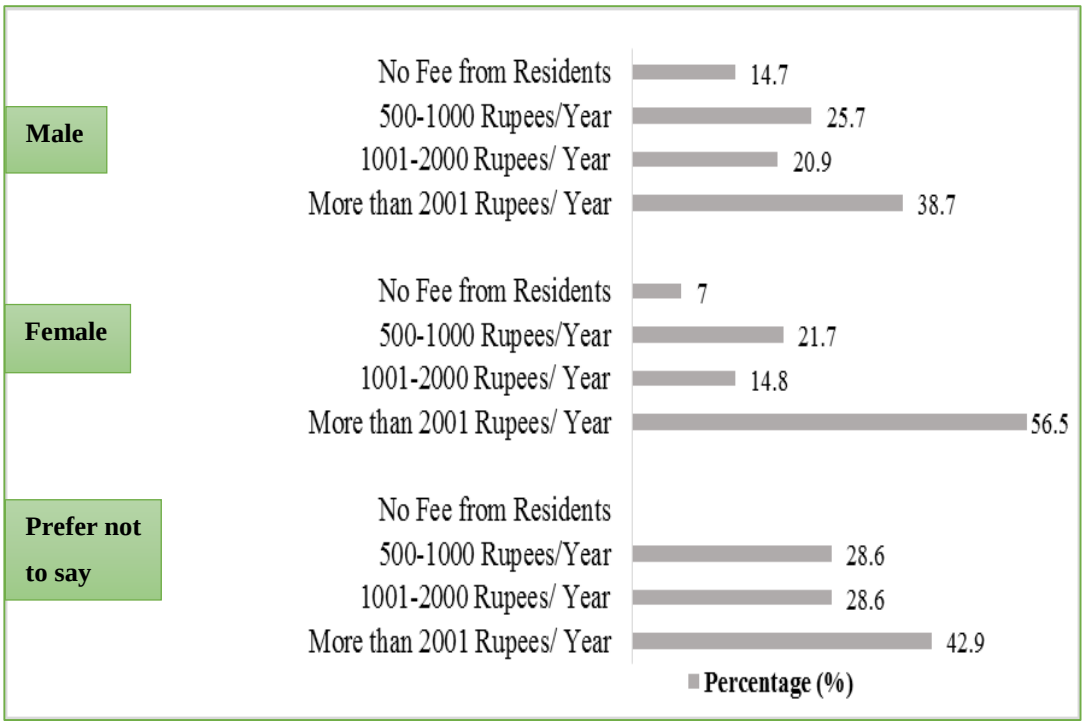


Chart 27. Annual Security Fee from residents of the city may be charged for the programme (Mlt)

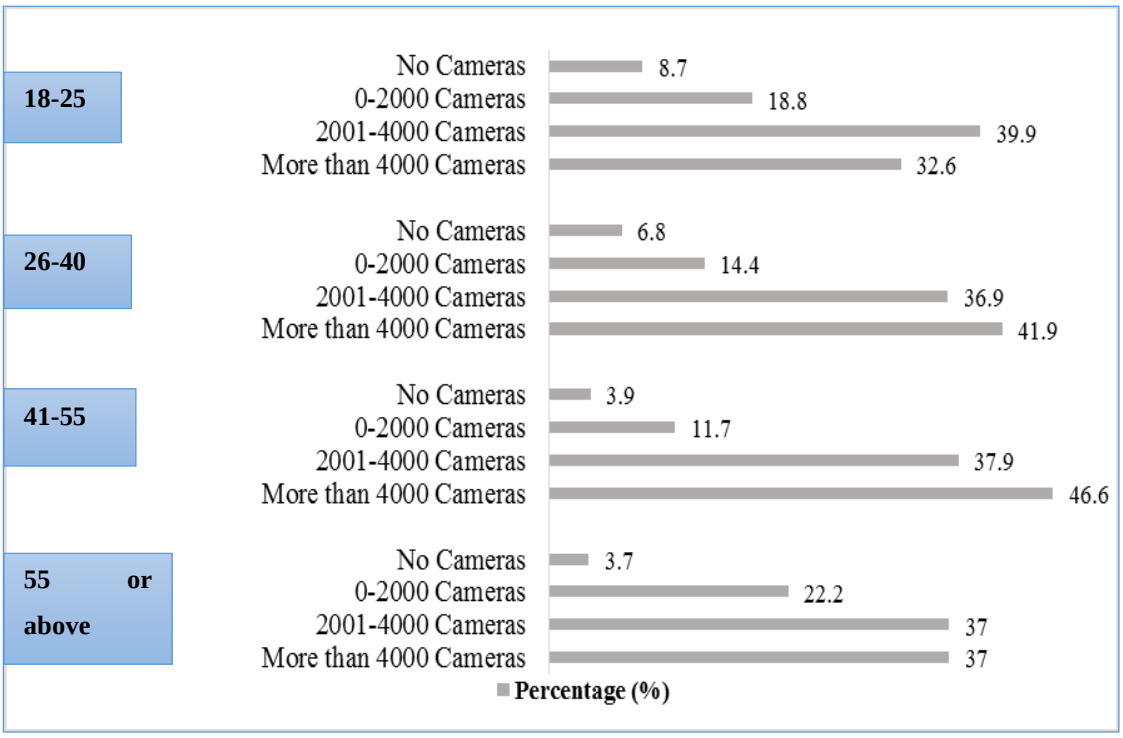


Chart 28. Proposed number of Cameras in the City (Rwp)

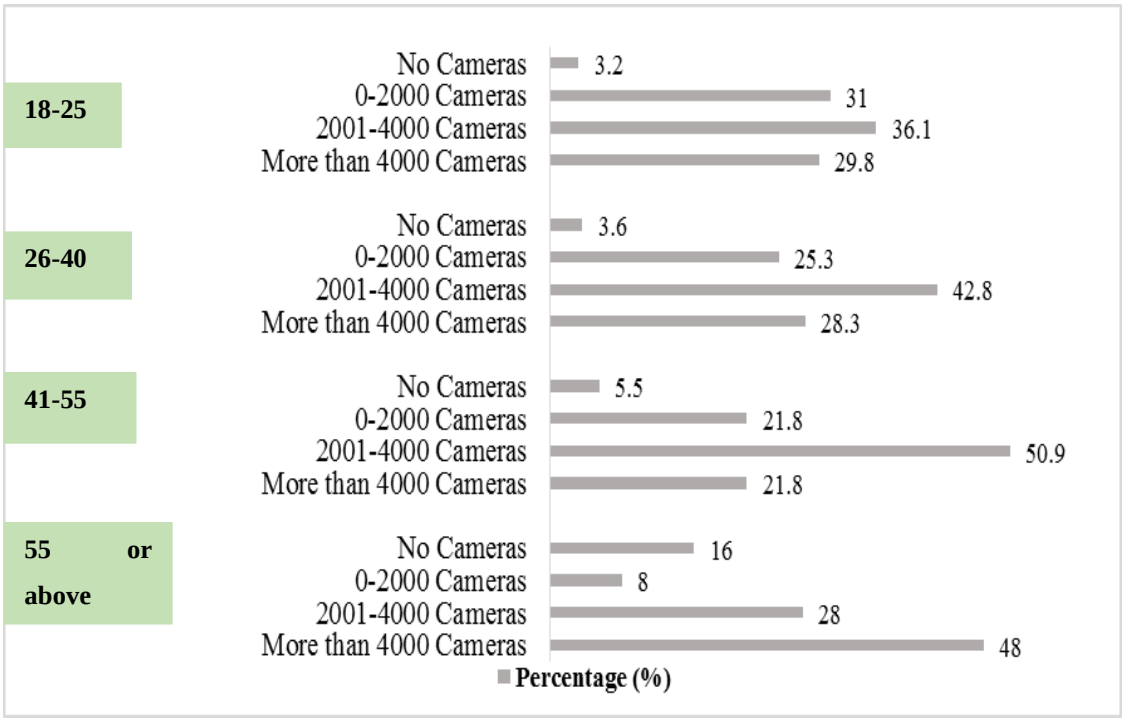


Chart 29. Proposed number of Cameras in the City (Mlt)

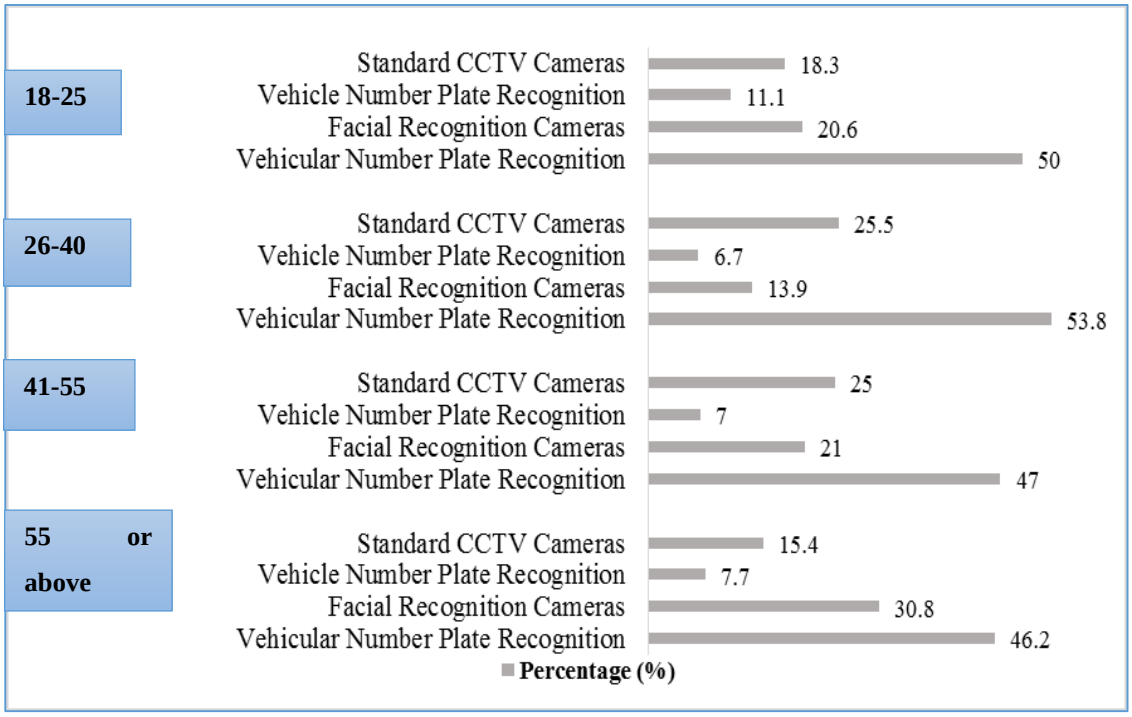


Chart 30. Types of Cameras in the City (Rwp)

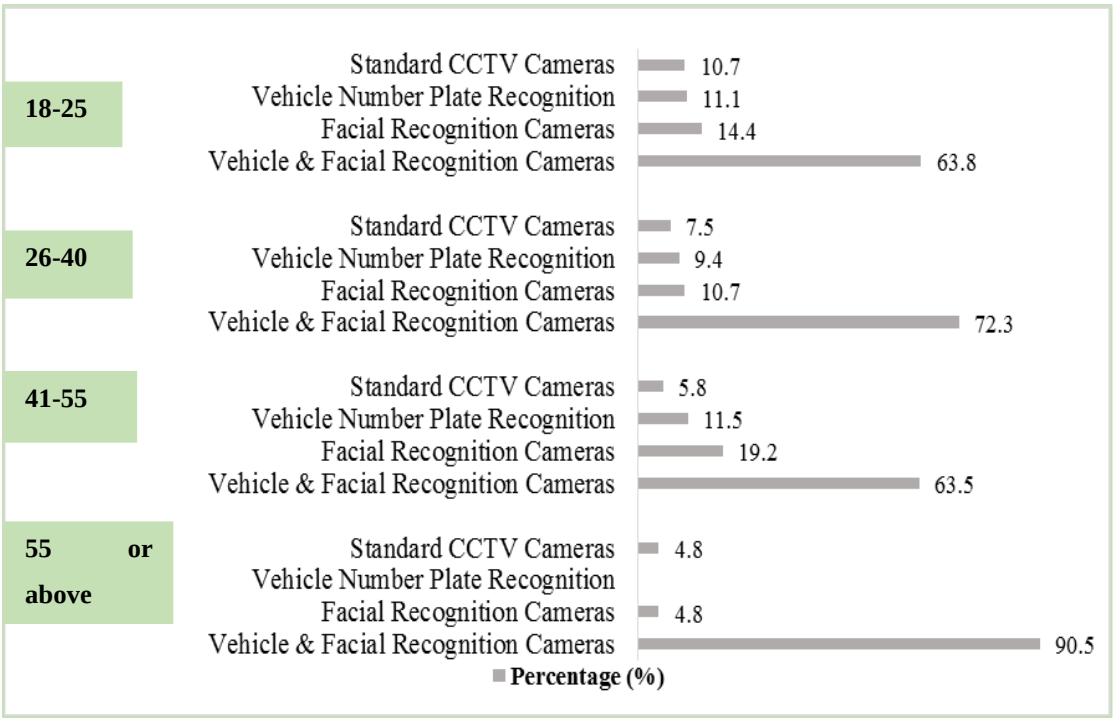


Chart 31. Types of Cameras in the City (Mlt)

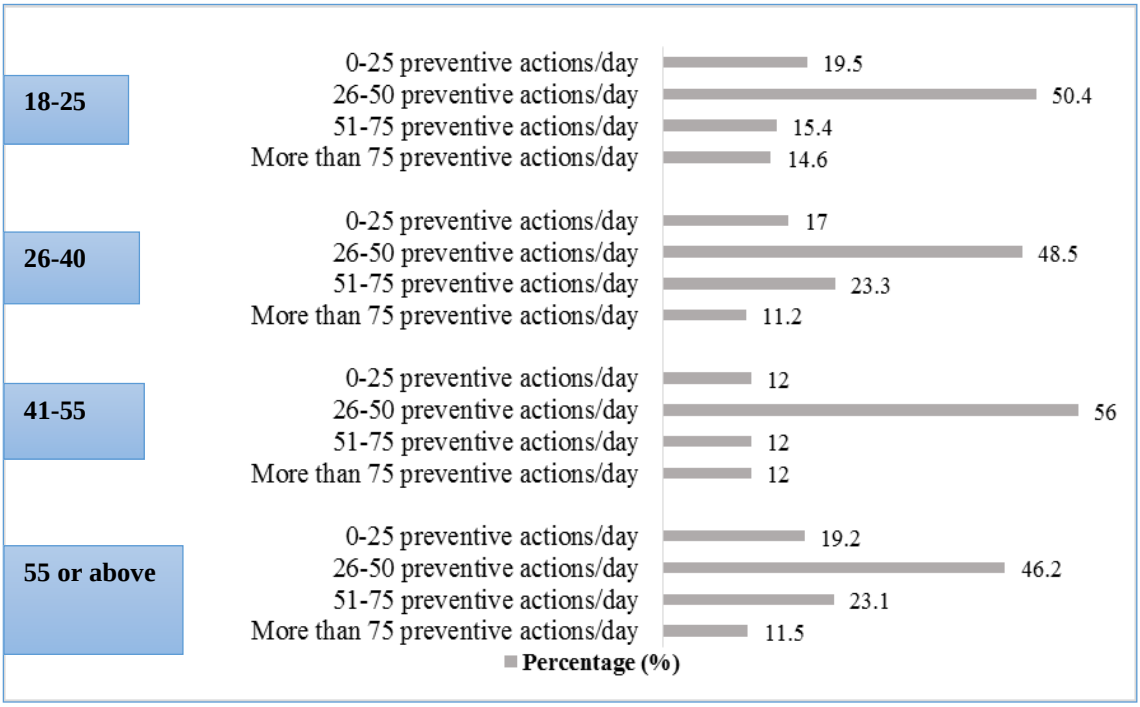


Chart 32. Probability of preventive action taken against suspicious activity BEFORE any incident/potential crime by Police with the help of CCTV cameras (Rwp)

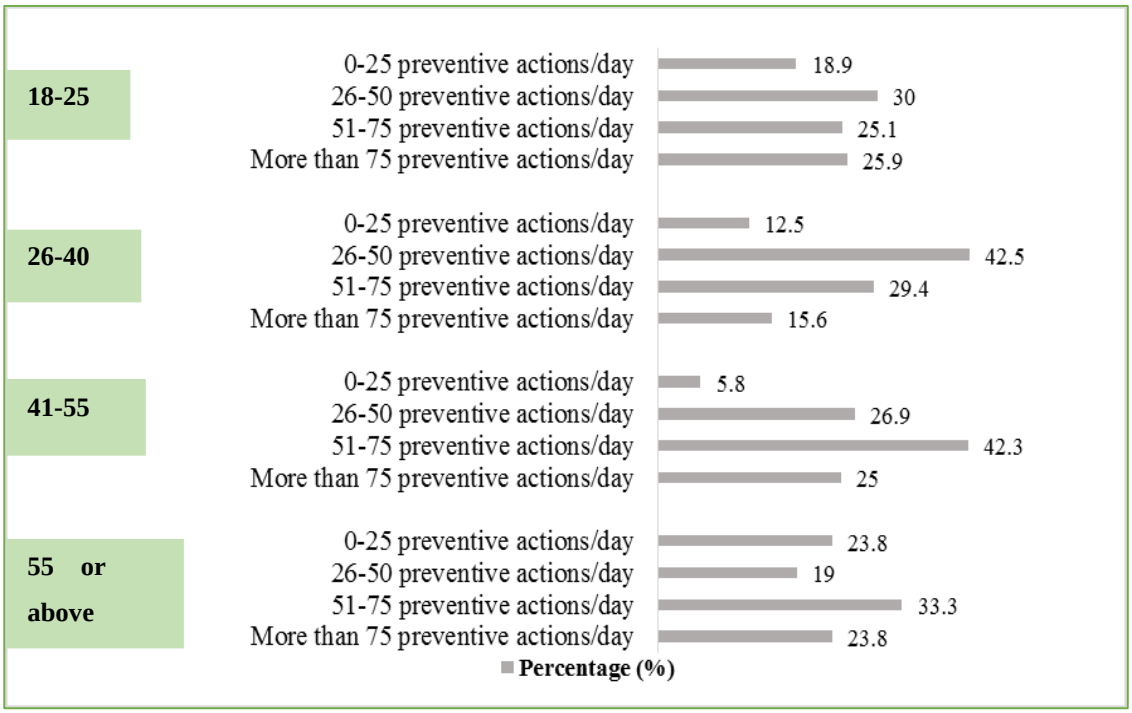


Chart 33. Probability of preventive action taken against suspicious activity BEFORE any incident/potential crime by Police with the help of CCTV cameras (Mlt)

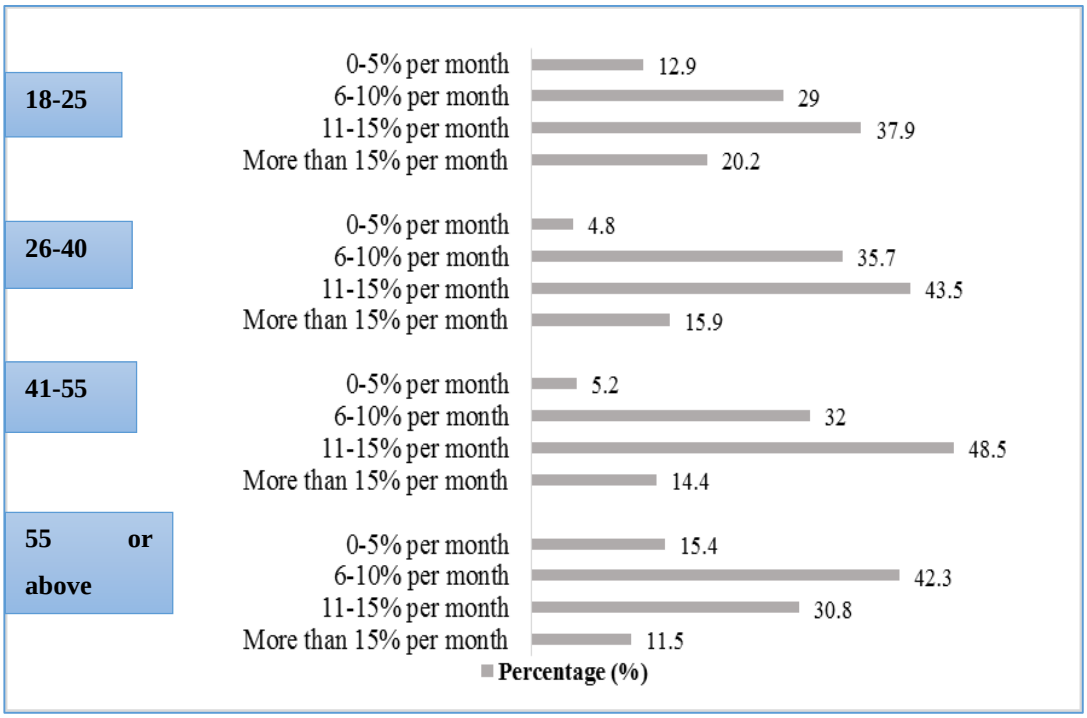


Chart 34. Percentage of crimes/cases resolved AFTER the crime/incidents by Police with the help of CCTV cameras every month (Rwp)

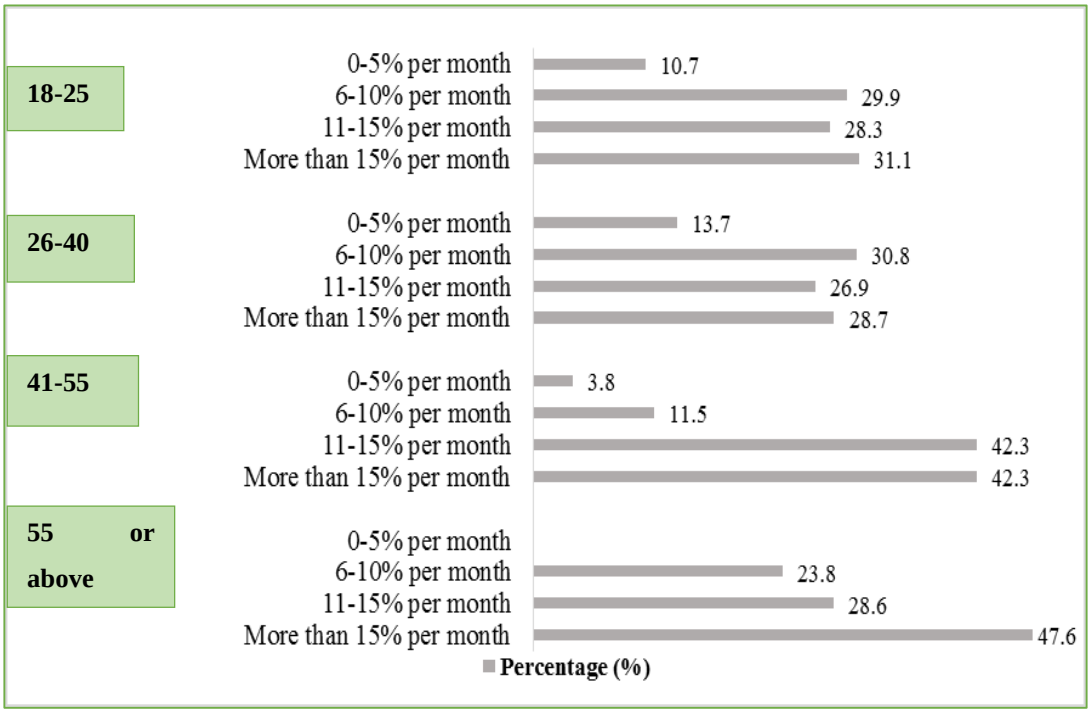


Chart 35. Percentage of crimes/cases resolved AFTER the crime/incidents by Police with the help of CCTV cameras every month (Mlt)

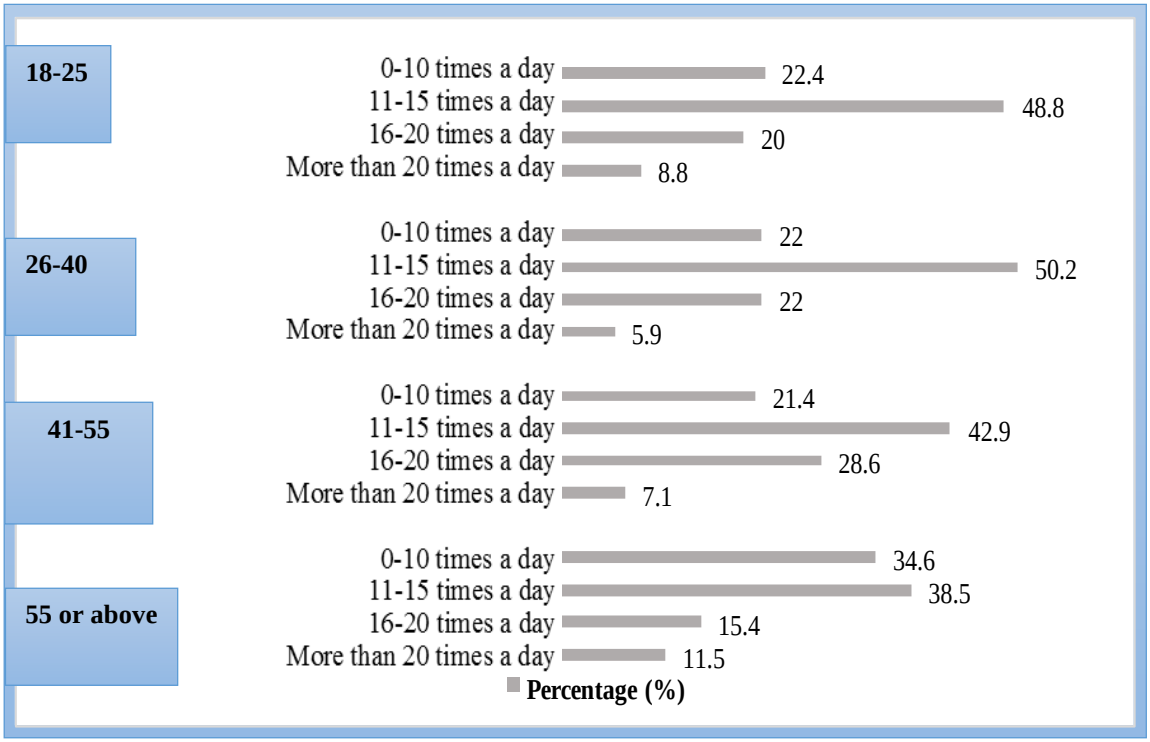


Chart 36. Public will be exposed to all surveillance as people may be observed through CCTV cameras daily (Rwp)

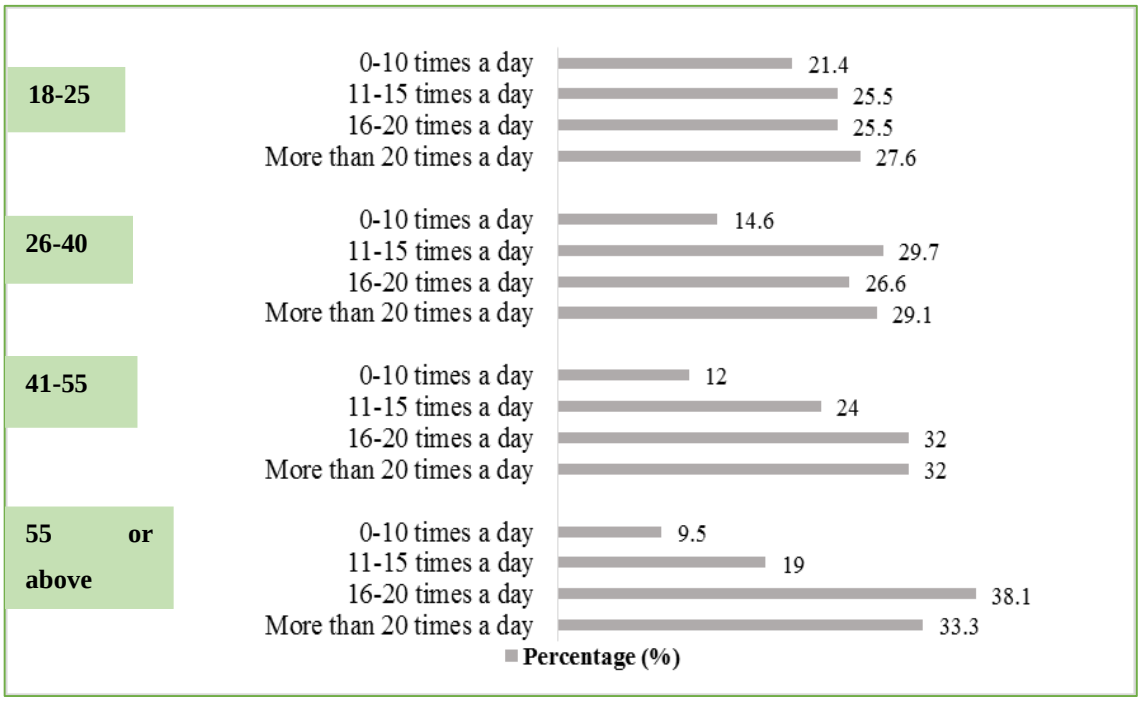


Chart 37. Public will be exposed to all surveillance as people may be observed through CCTV cameras daily (Mlt)

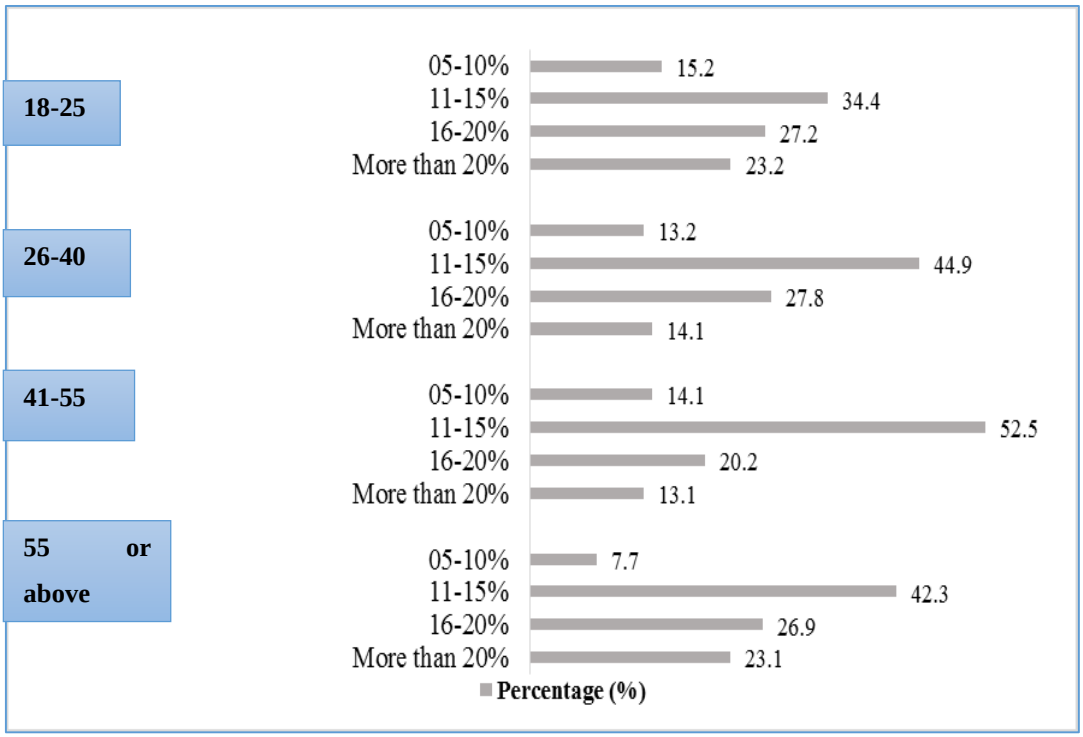


Chart 38. Annual reduction in crime by surveillance through CCTV cameras (Rwp)

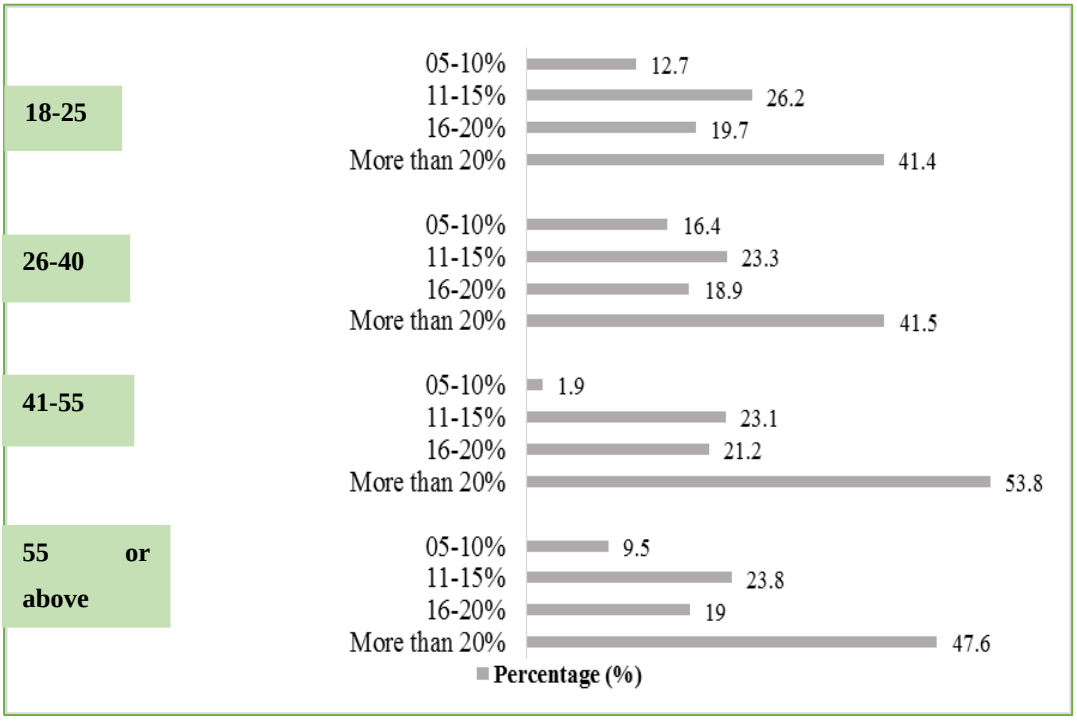


Chart 39. Annual reduction in crime by surveillance through CCTV cameras (Mlt)

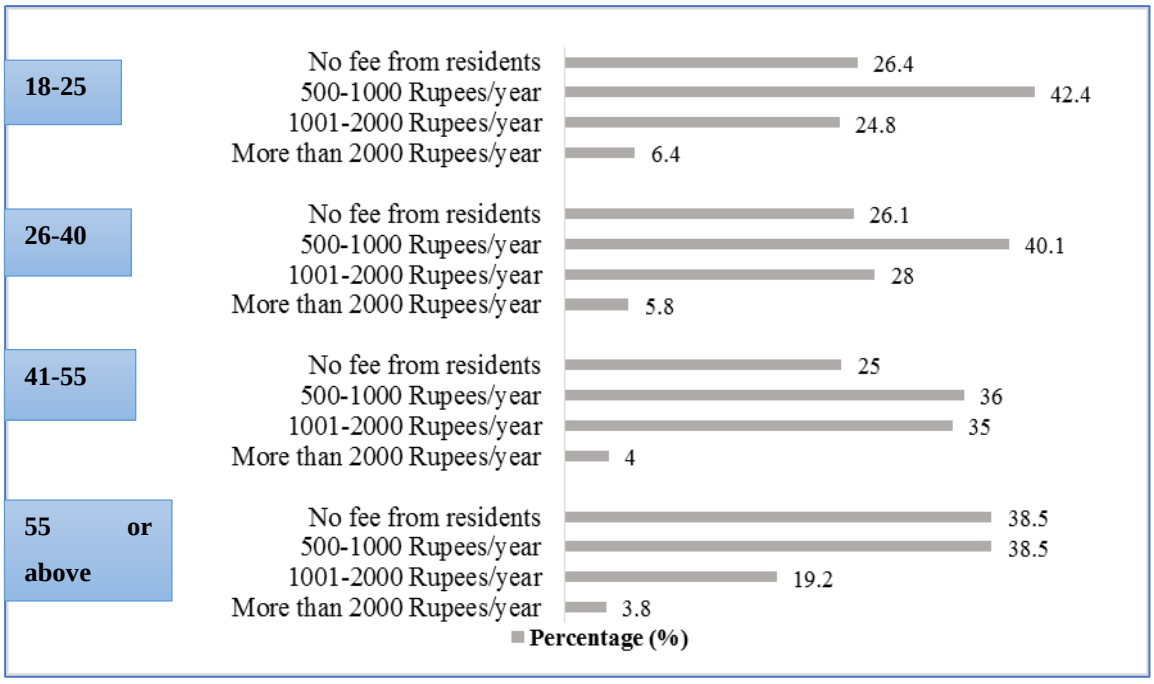


Chart 40. Annual *Security Fee* from residents of the city may be charged for programme (Rwp)

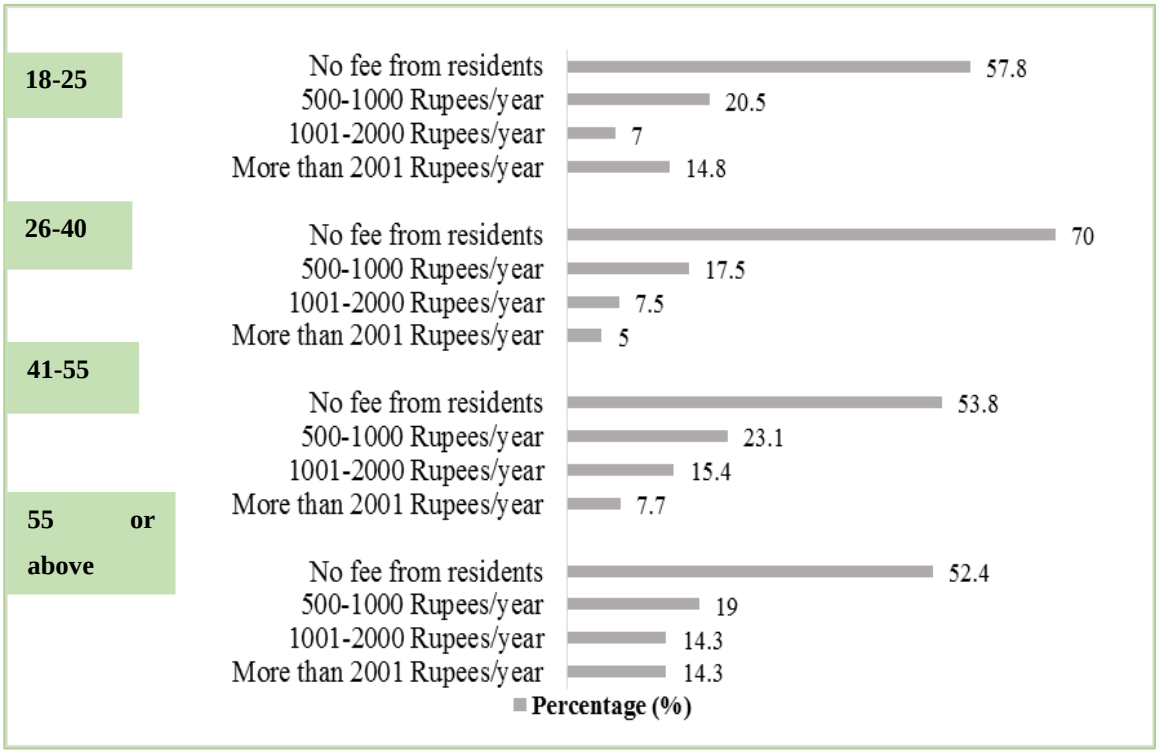


Chart 41. Annual *Security Fee* from residents of the city may be charged for programme (Mlt)

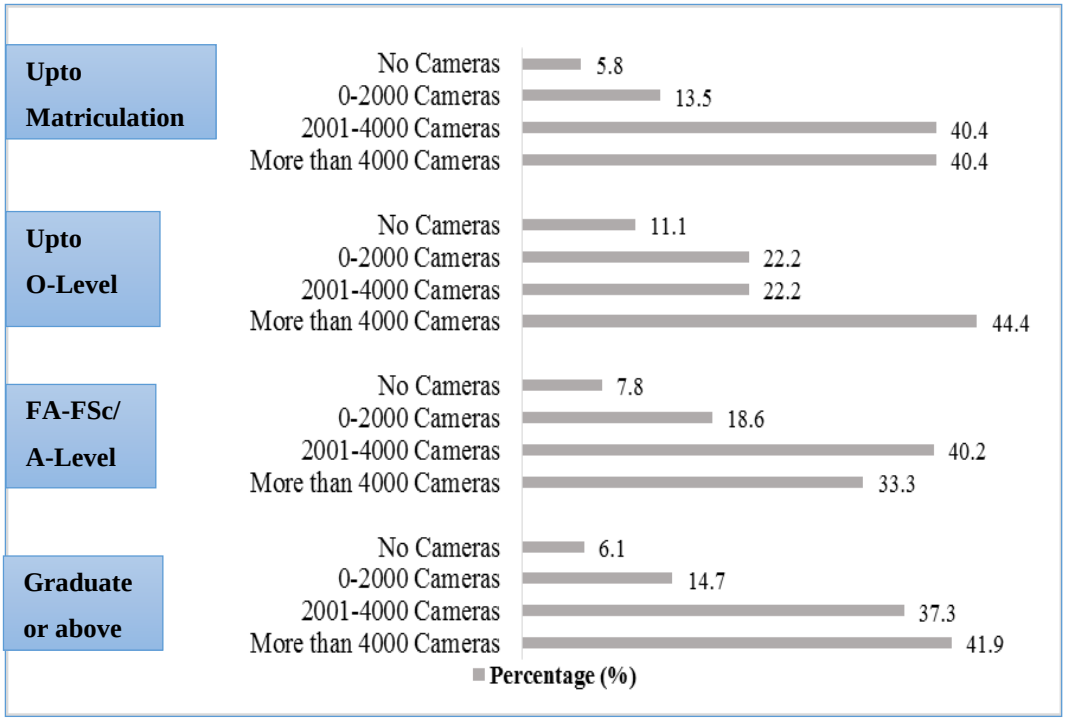


Chart 42. Proposed number of Cameras in the City (Rwp)

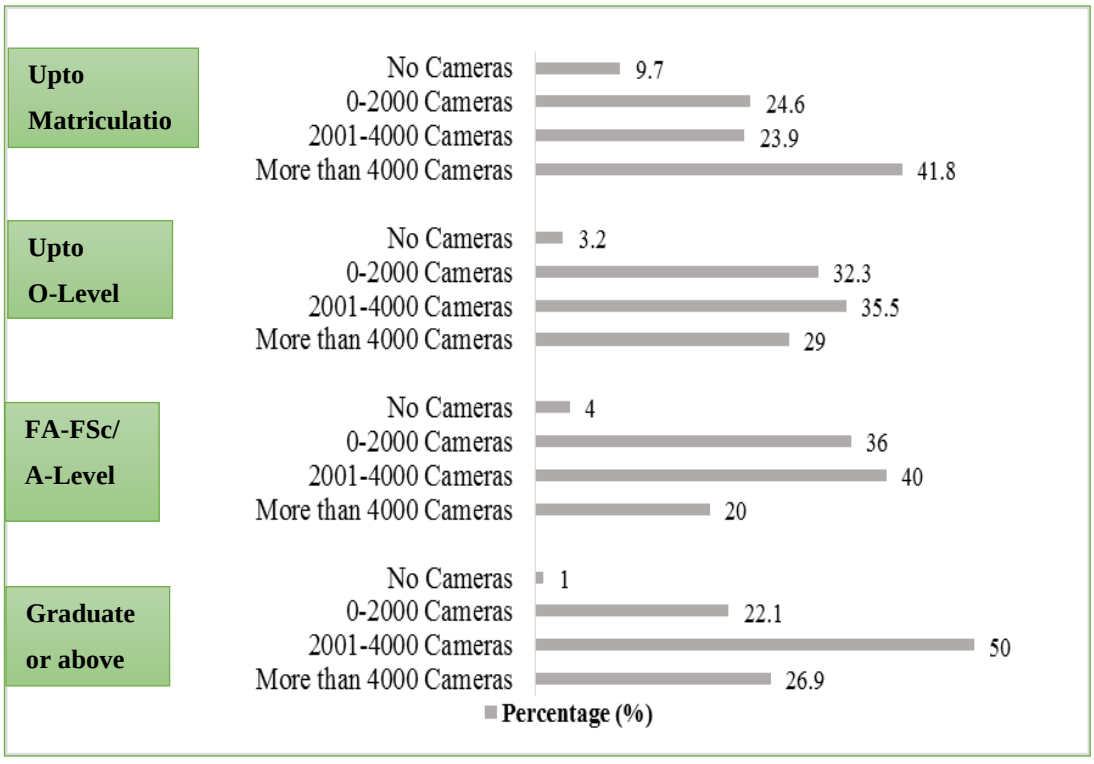


Chart 43. Proposed number of Cameras in the City (Mlt)

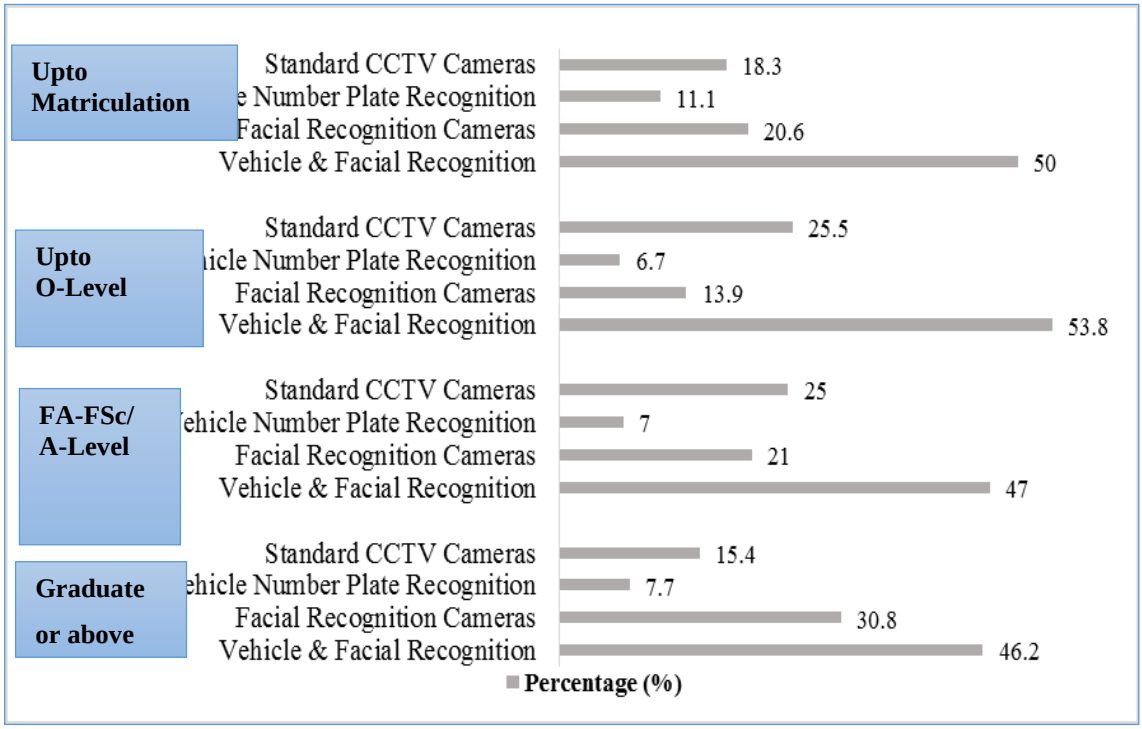


Chart 44. Types of Cameras in the City (Rwp)

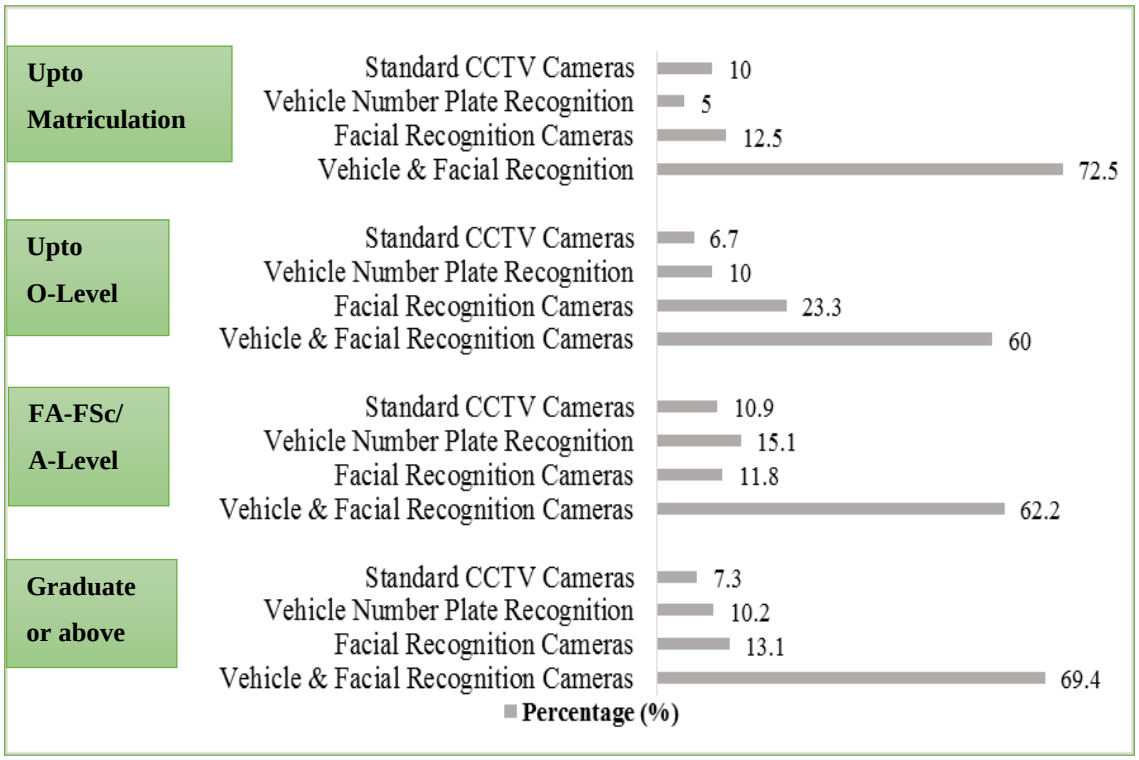


Chart 45. Types of Cameras in the City (Mlt)

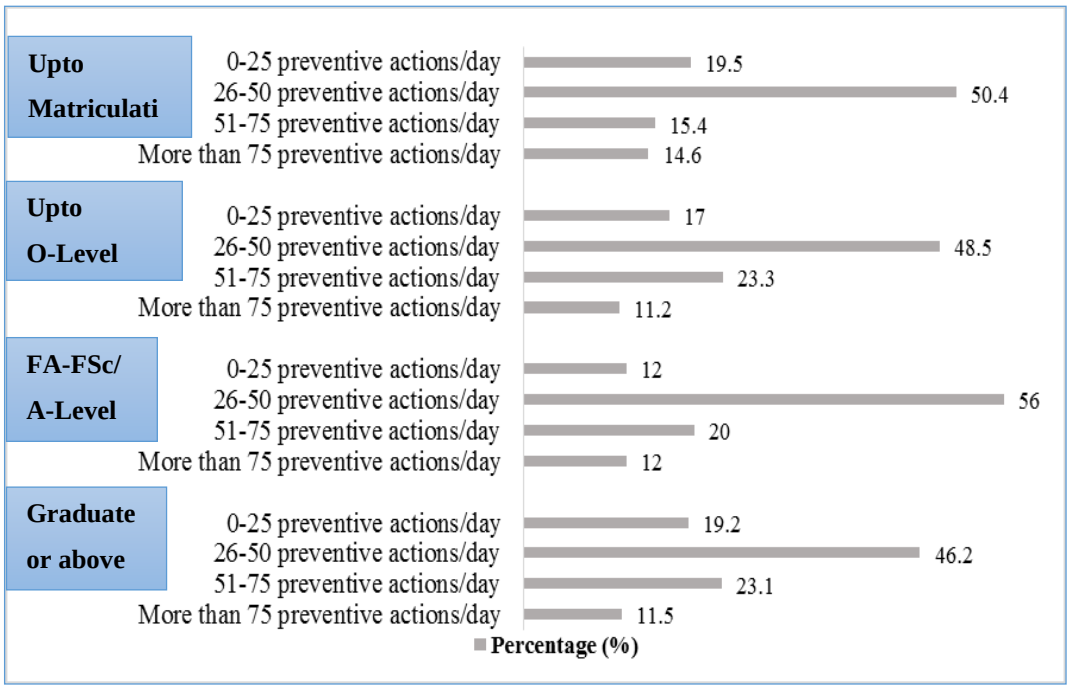


Chart 46. Probability of Preventive action taken against suspicious activity BEFORE any incident/potential crime by Police with the help of CCTV cameras (Rwp)

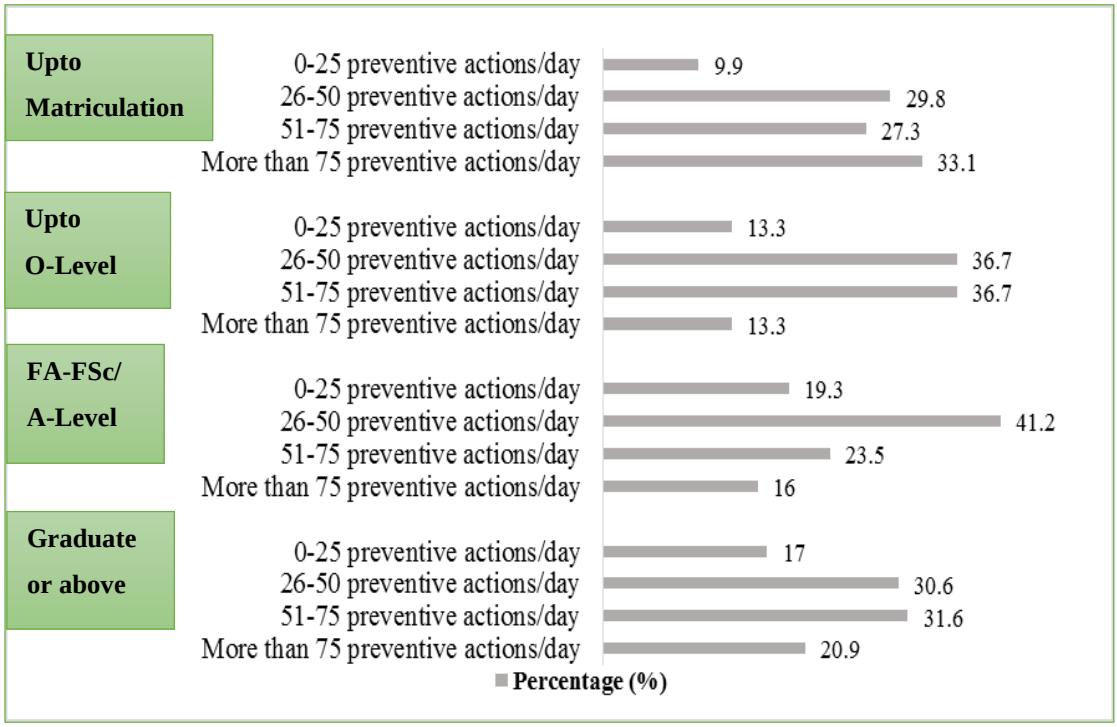


Chart 47. Probability of Preventive action taken against suspicious activity BEFORE any incident/potential crime by Police with the help of CCTV cameras (Mlt)

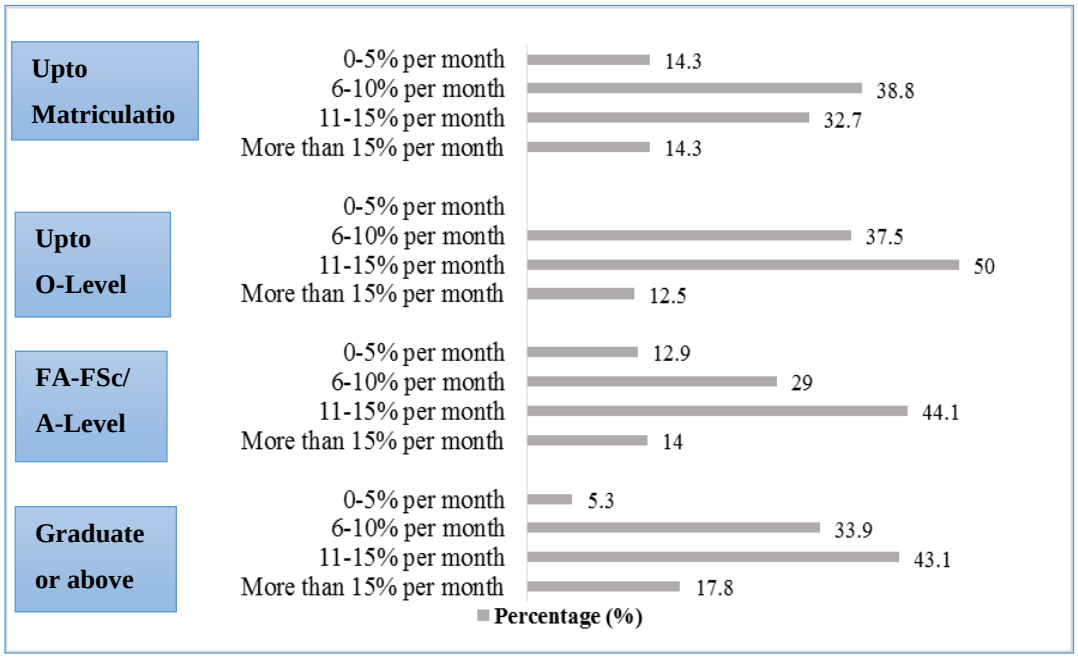


Chart 48. Percentage of crimes/cases resolved AFTER the crime/incidents by Police with the help of CCTV cameras every month (Rwp)

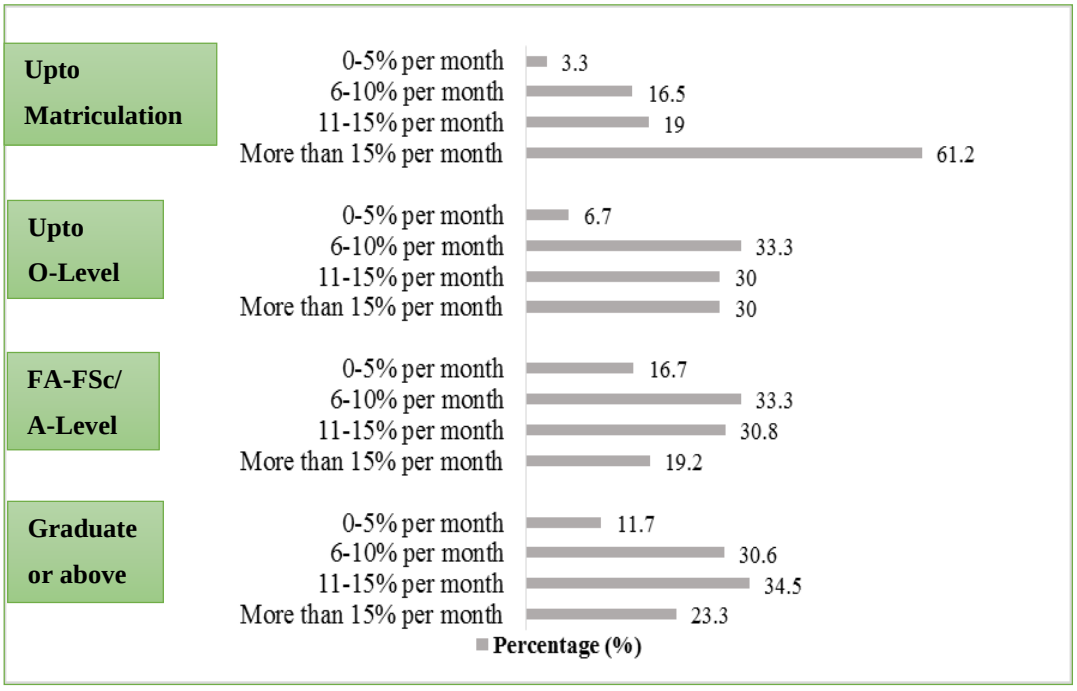


Chart 49. Percentage of crimes/cases resolved AFTER the crime/incidents by Police with the help of CCTV cameras every month (Mlt)

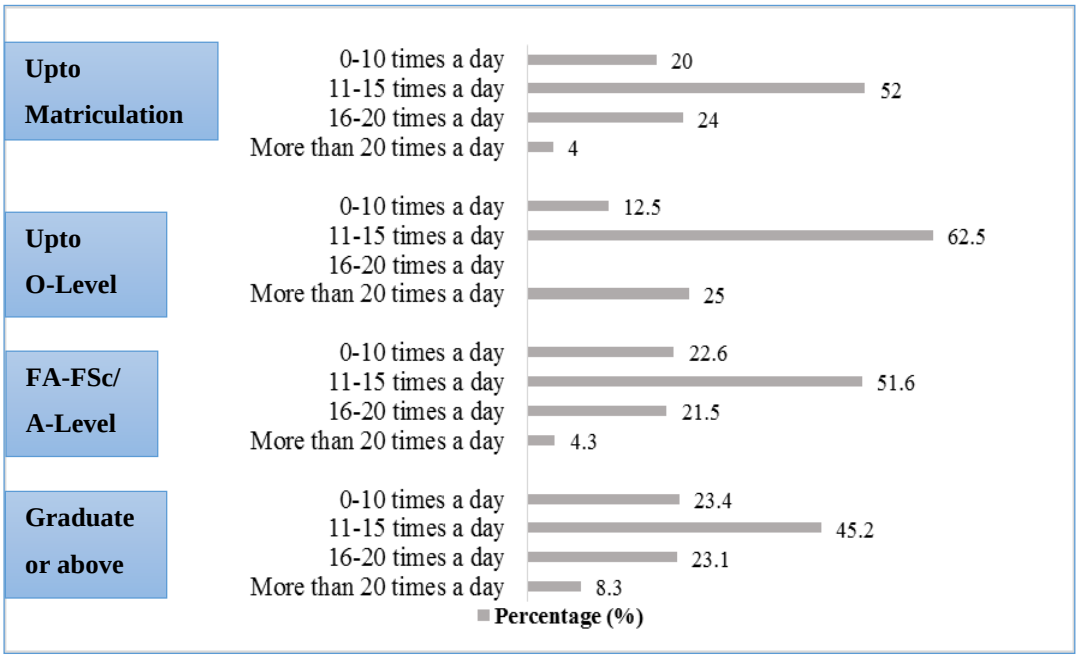


Chart 50. Public will be exposed to all surveillance as people may be observed through CCTV cameras daily (Rwp)

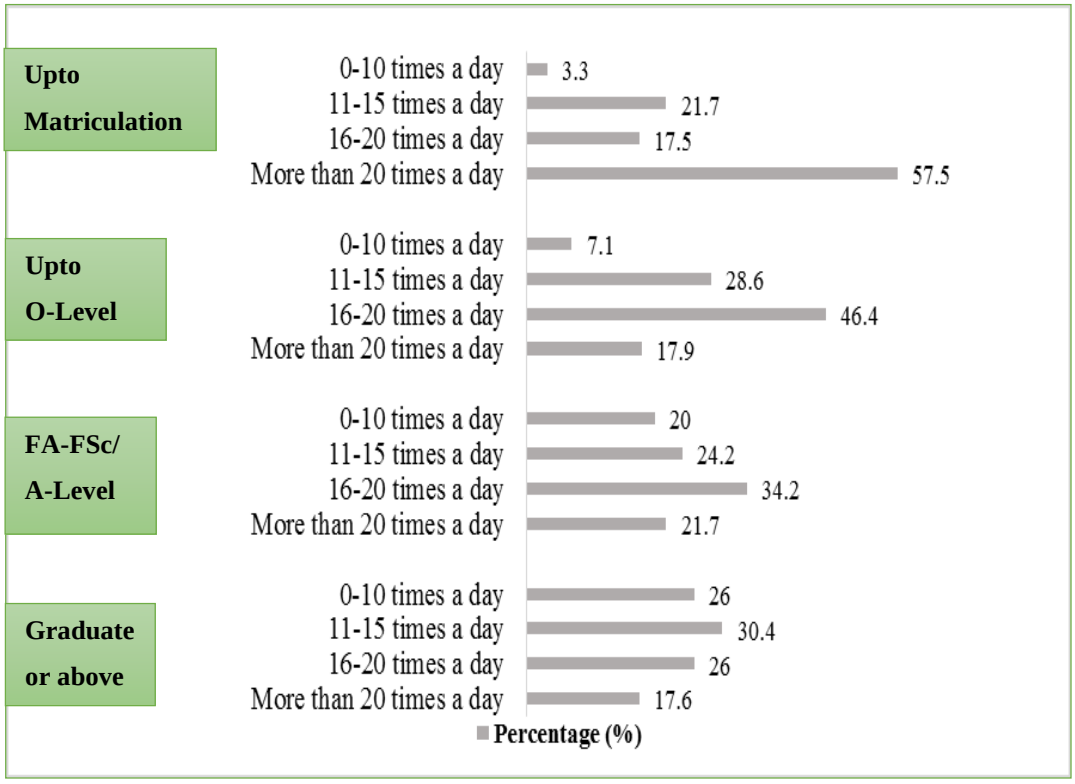


Chart 51. Public will be exposed to all surveillance as people may be observed through CCTV cameras daily (Mlt)

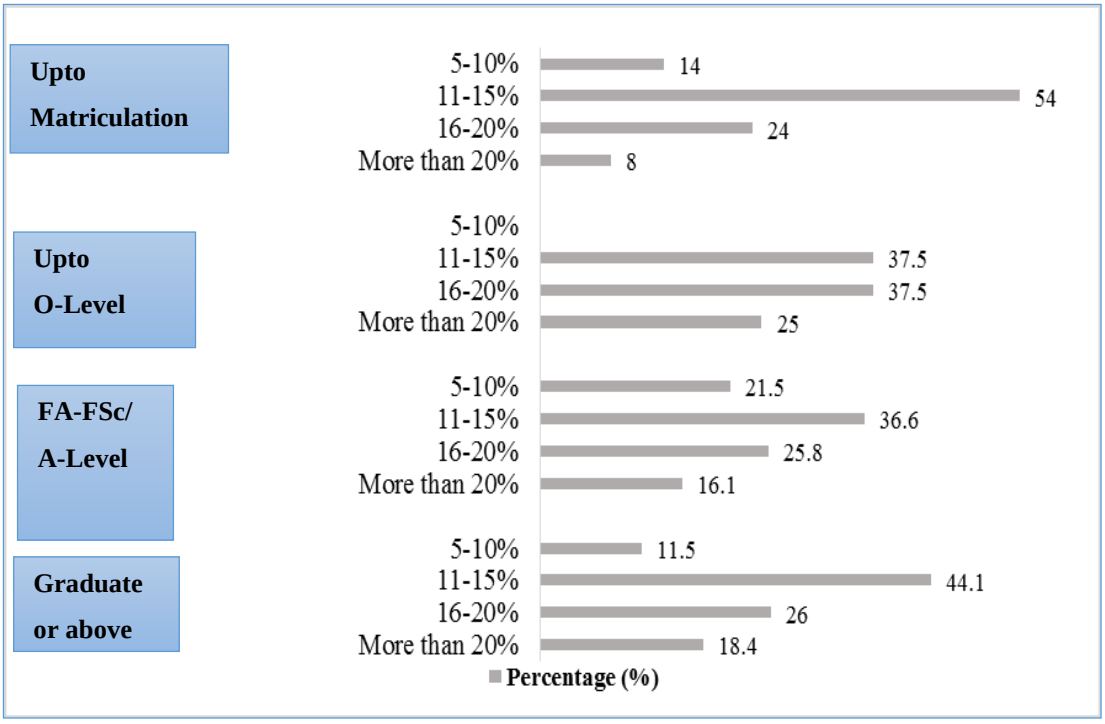


Chart 52. Annual reduction in crime by surveillance through CCTV cameras (Rwp)

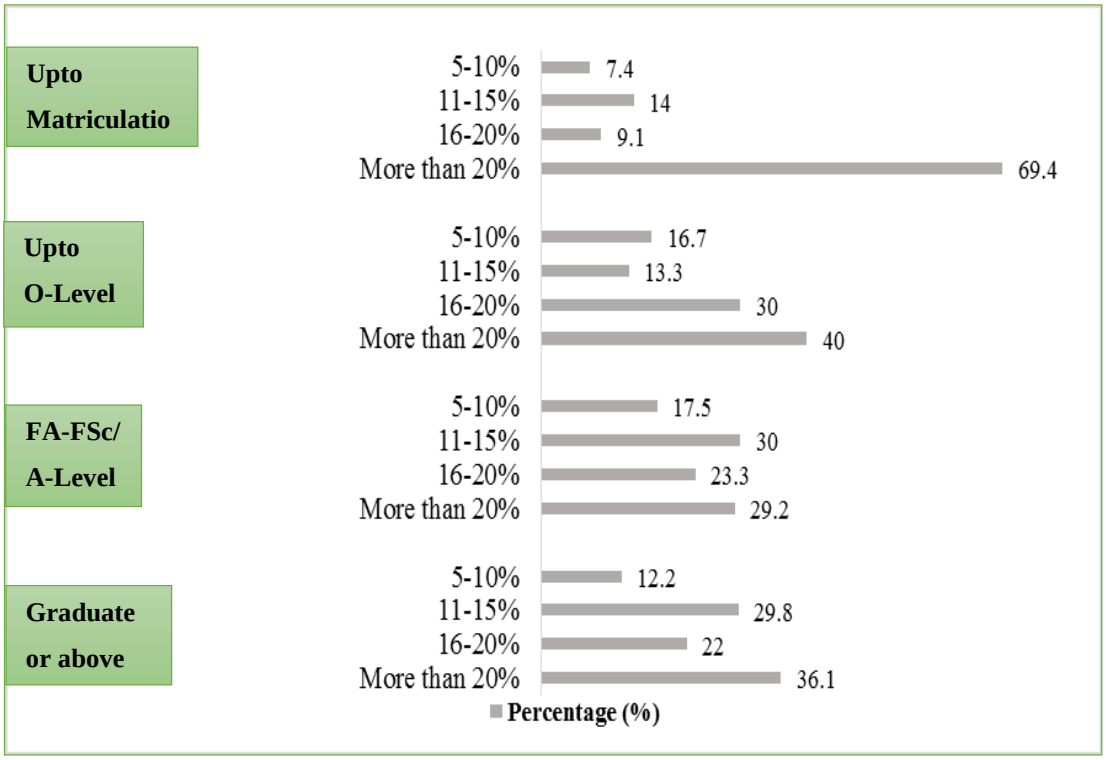


Chart 53. Annual reduction in crime by surveillance through CCTV cameras (Mlt)

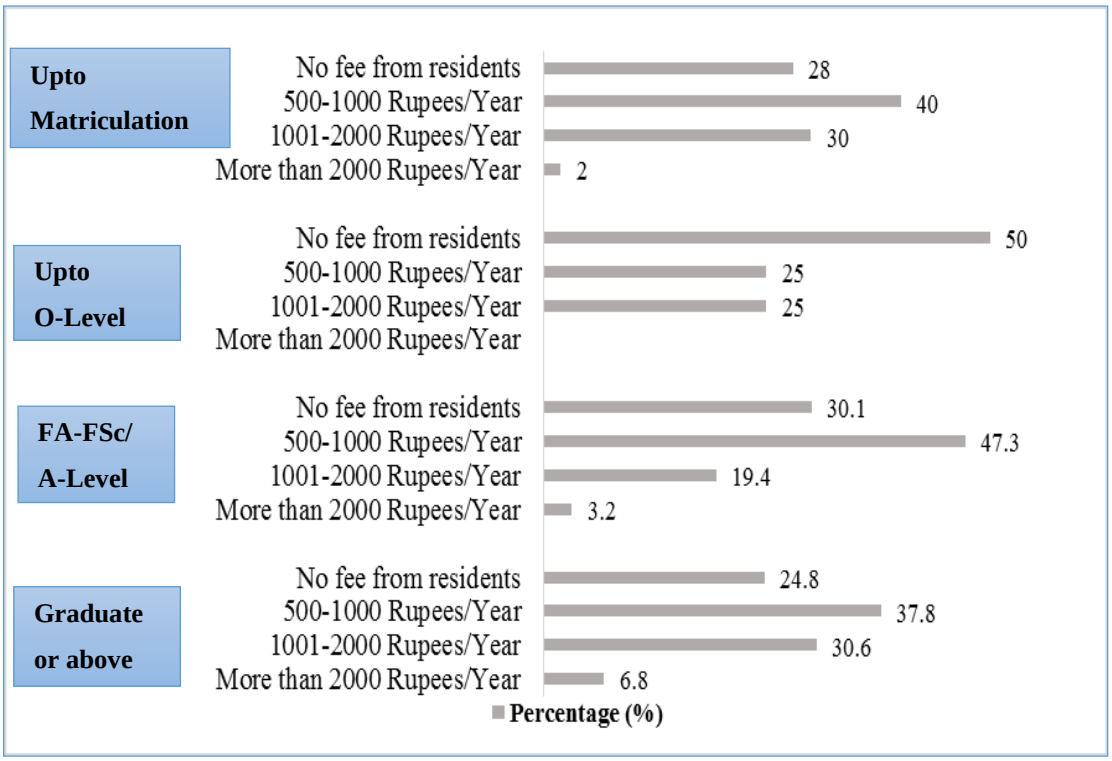


Chart 54. Annual *Security Fee* from residents of the city may be charged for programme (Rwp)

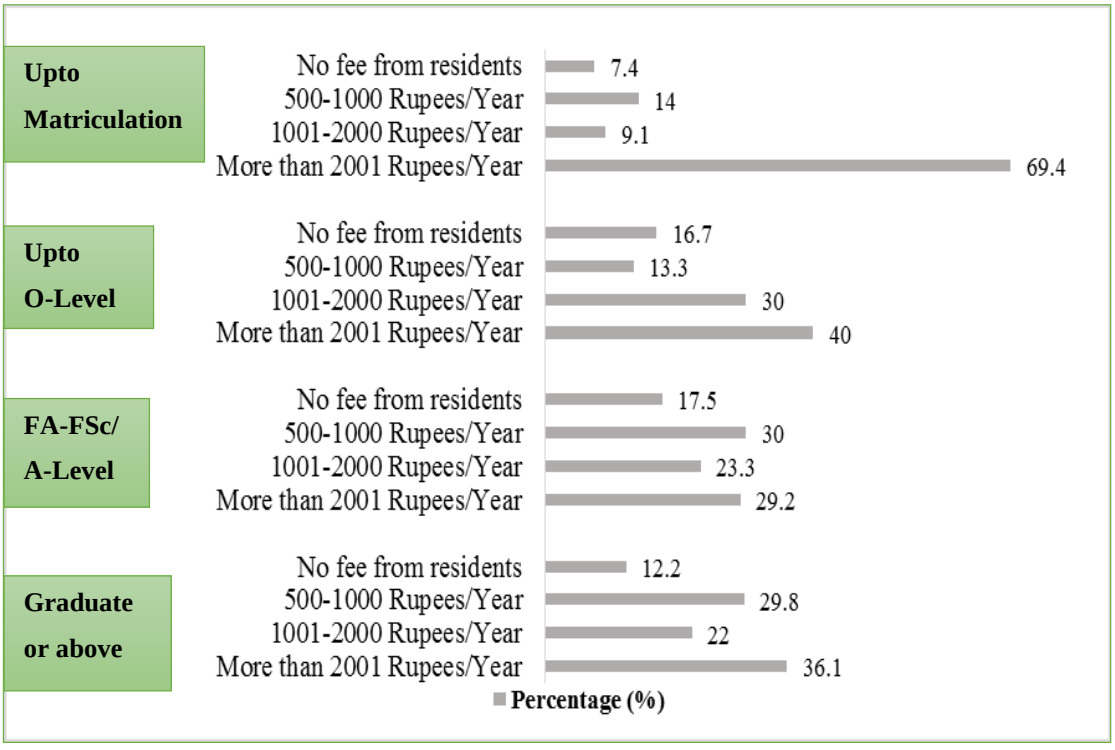


Chart 55. Annual *Security Fee* from residents of the city may be charged for programme (Mlt)

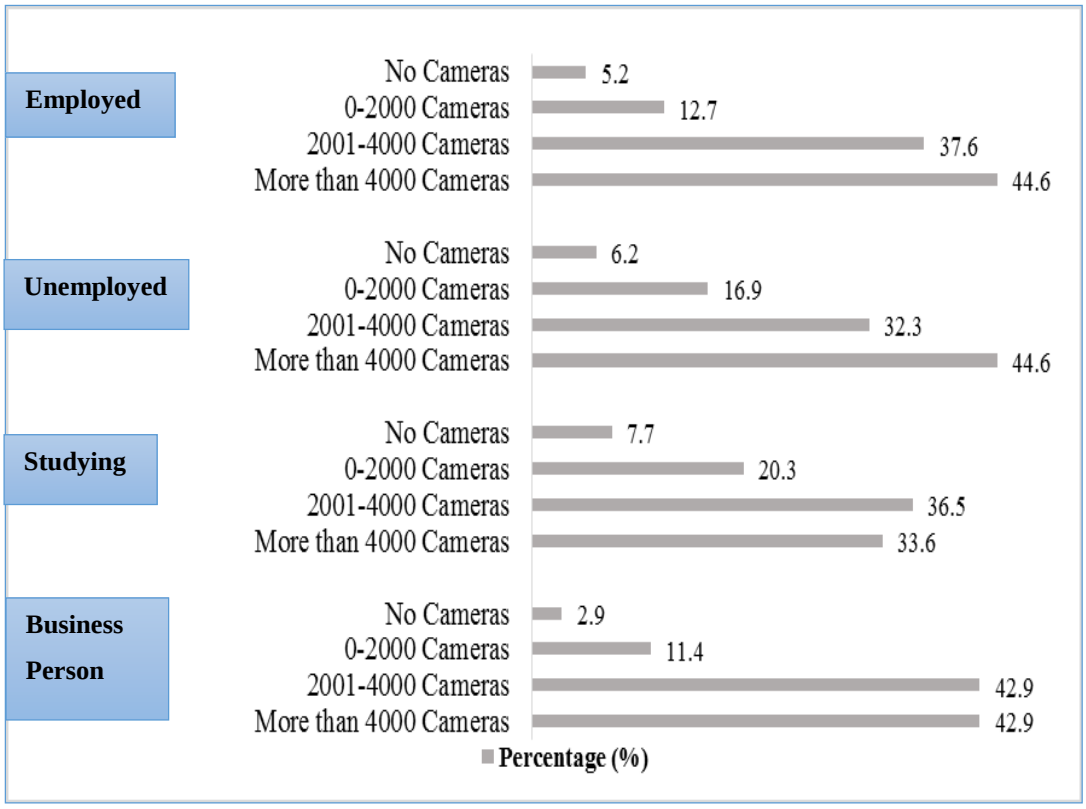


Chart 56. Proposed number of Cameras in the City (Rwp)

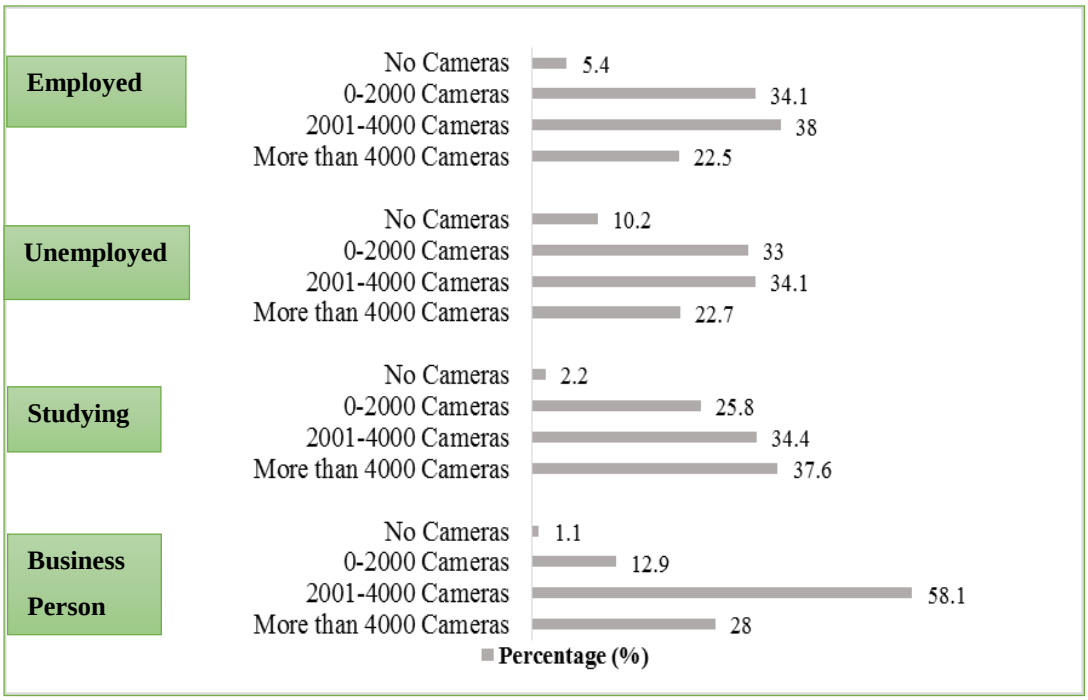


Chart 57. Proposed number of Cameras in the City (Mlt)

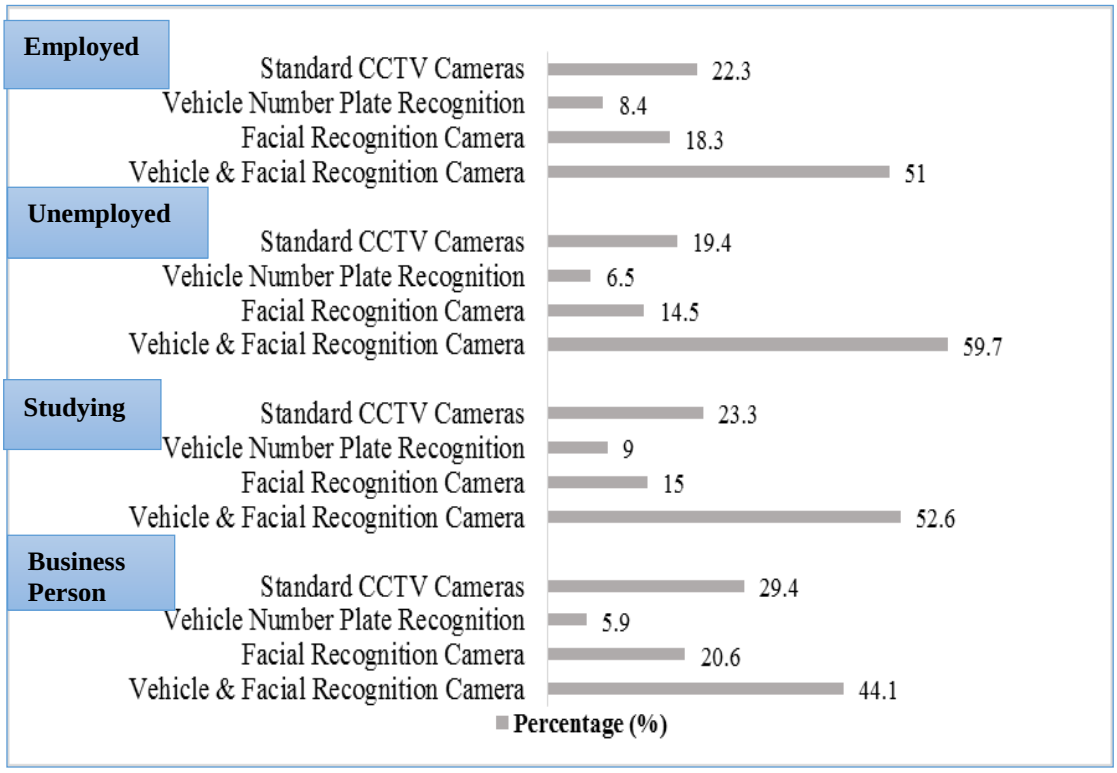


Chart 58. Types of Cameras installed in the City (Rwp)

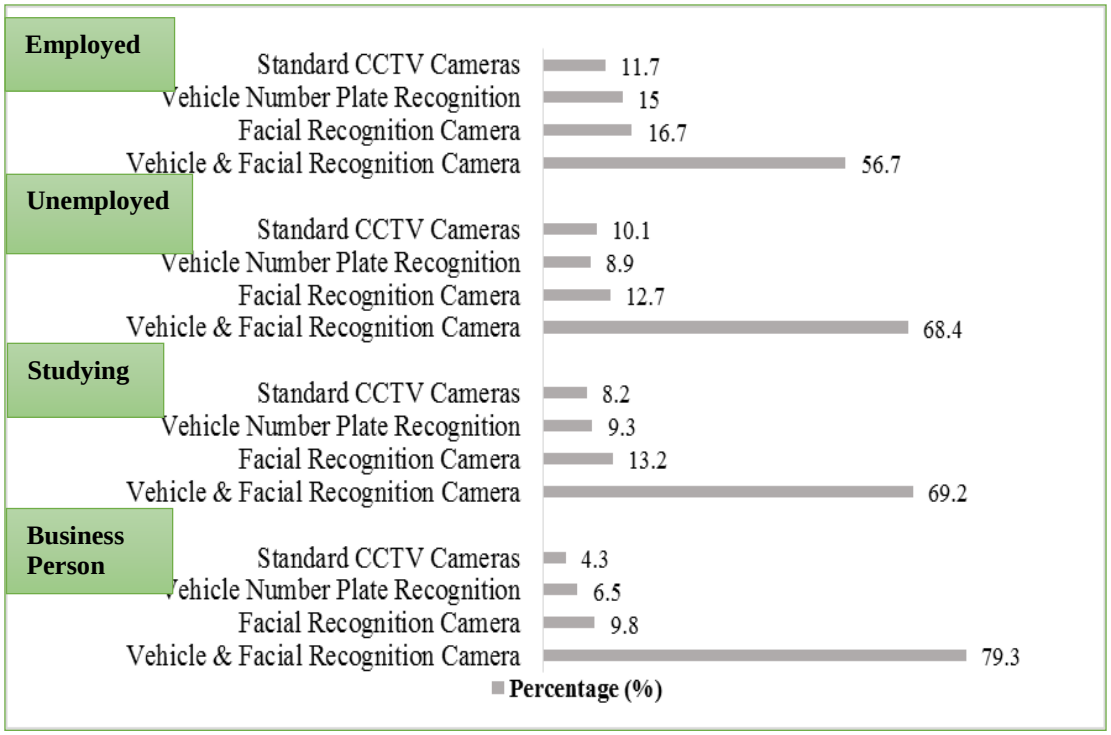


Chart 59. Types of Cameras installed in the City (Mlt)

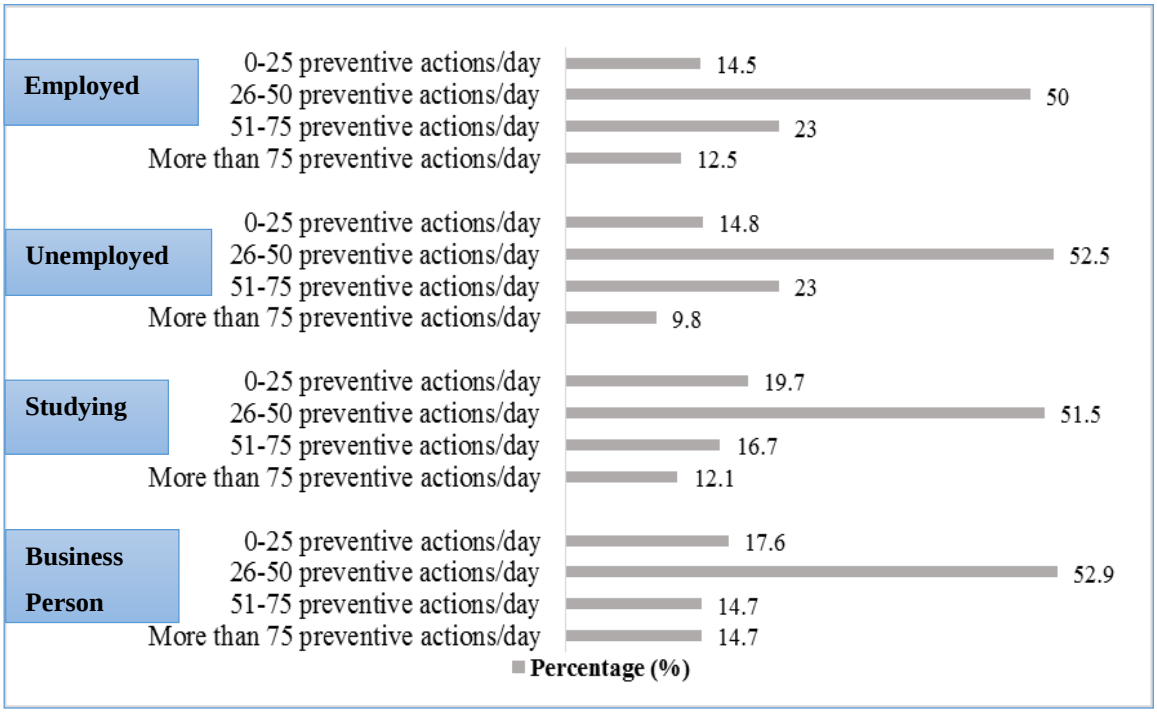


Chart 60. Probability of preventive action taken against suspicious activity BEFORE any incident/potential crime by Police with the help of CCTV cameras of Cameras installed in the City (Rwp)

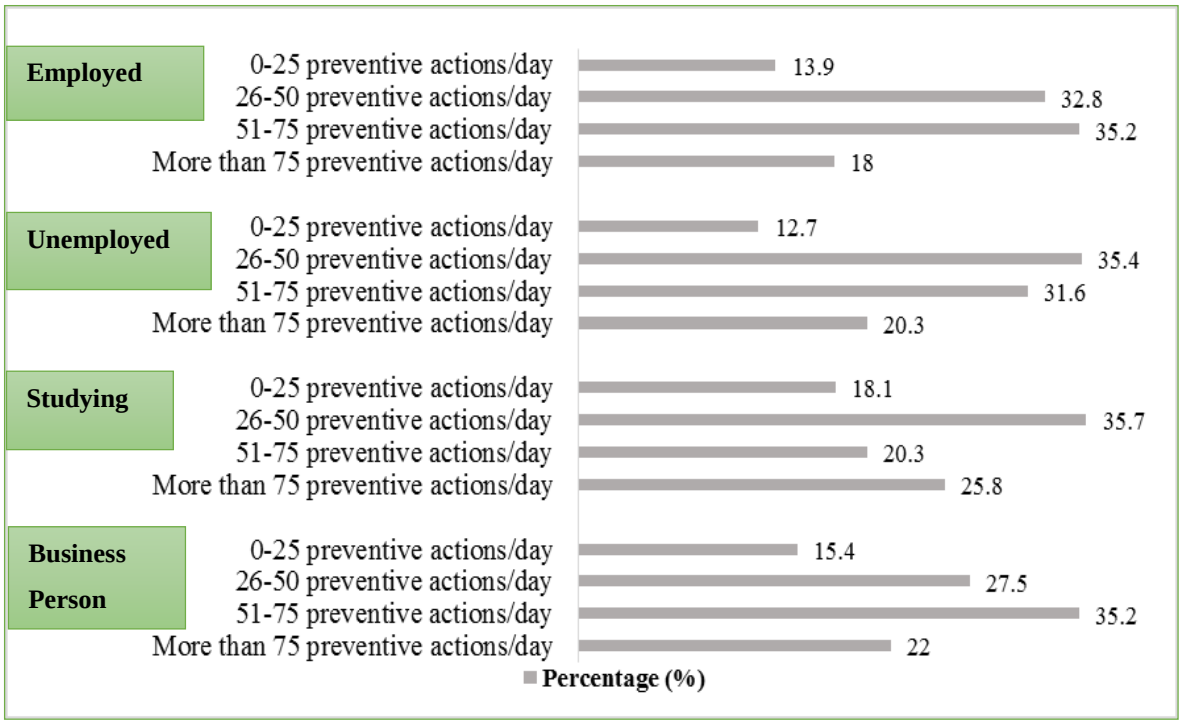


Chart 61. Probability of preventive action taken against suspicious activity BEFORE any incident/potential crime by Police with the help of CCTV cameras of Cameras installed in the City (Mlt)

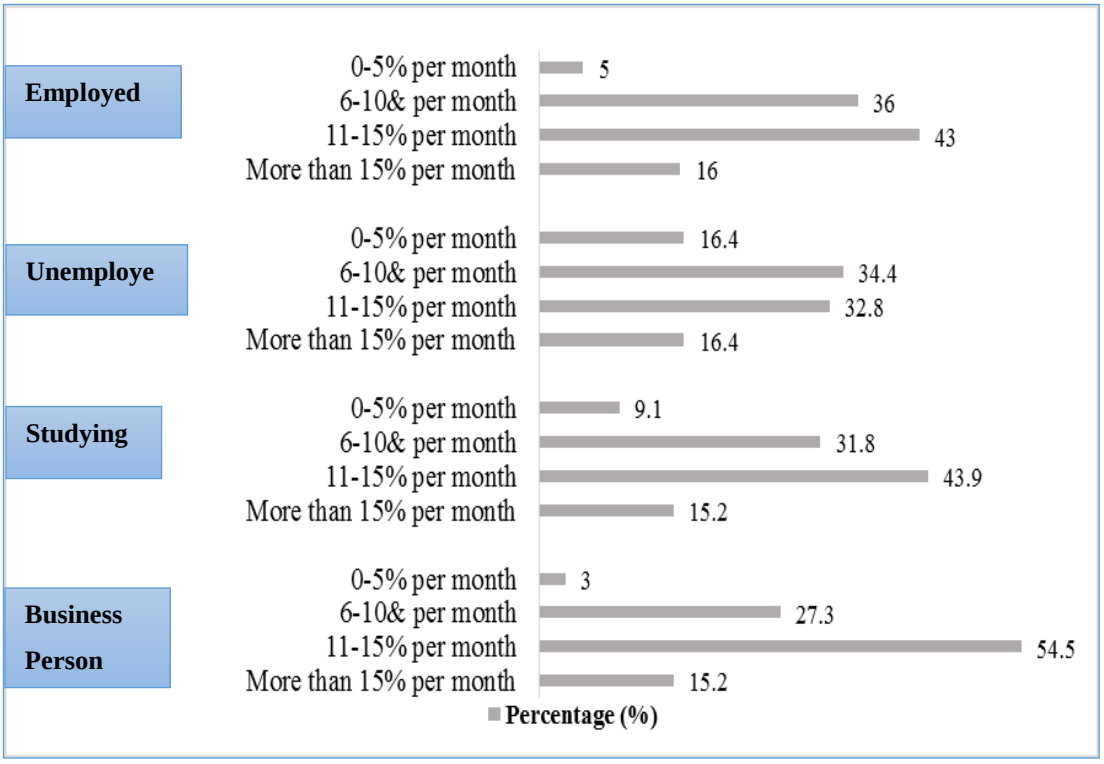


Chart 62. Percentage of crimes/cases resolved AFTER the crime/incidents by Police with the help of CCTV cameras every month (Rwp)

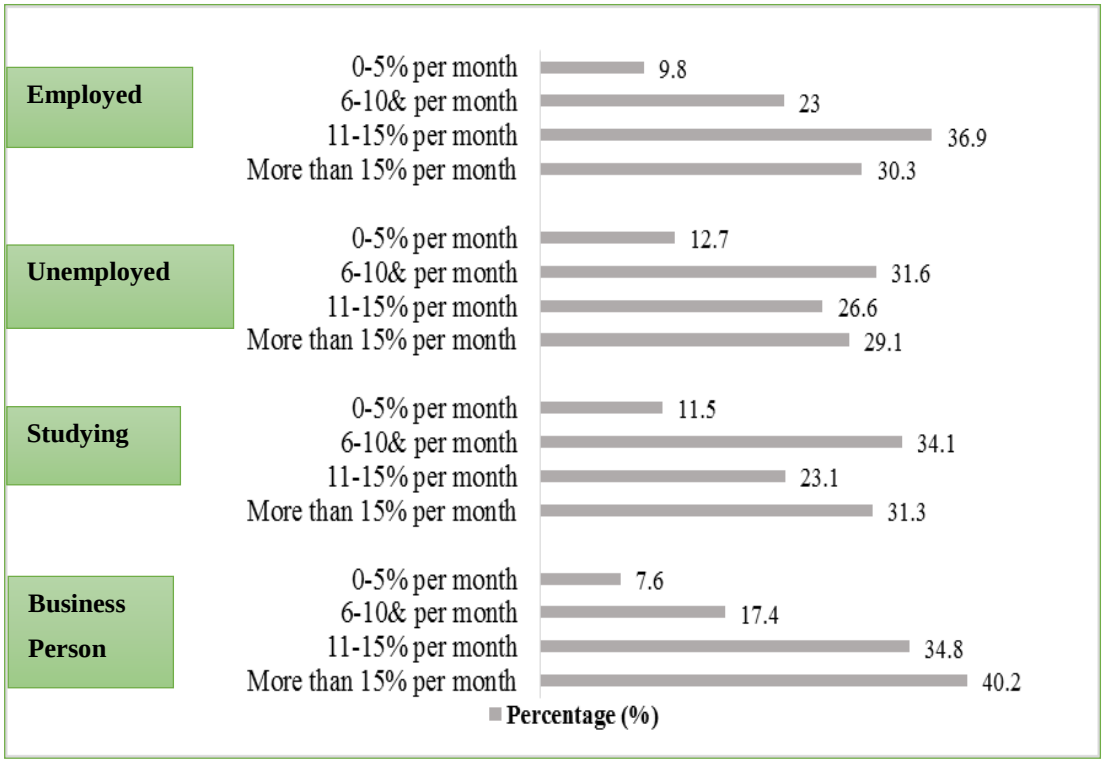


Chart 63. Percentage of crimes/cases resolved AFTER the crime/incidents by Police with the help of CCTV cameras every month (Mlt)

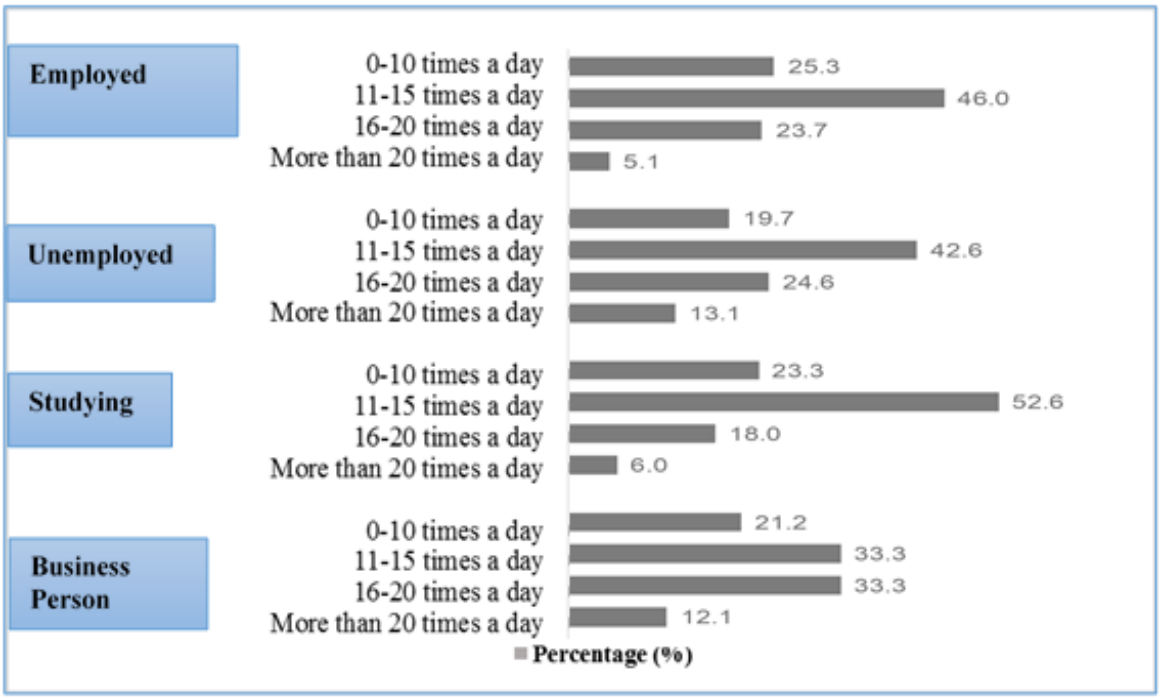


Chart 64. Public will be exposed to all surveillance as people may be observed through CCTV cameras daily (Rwp)

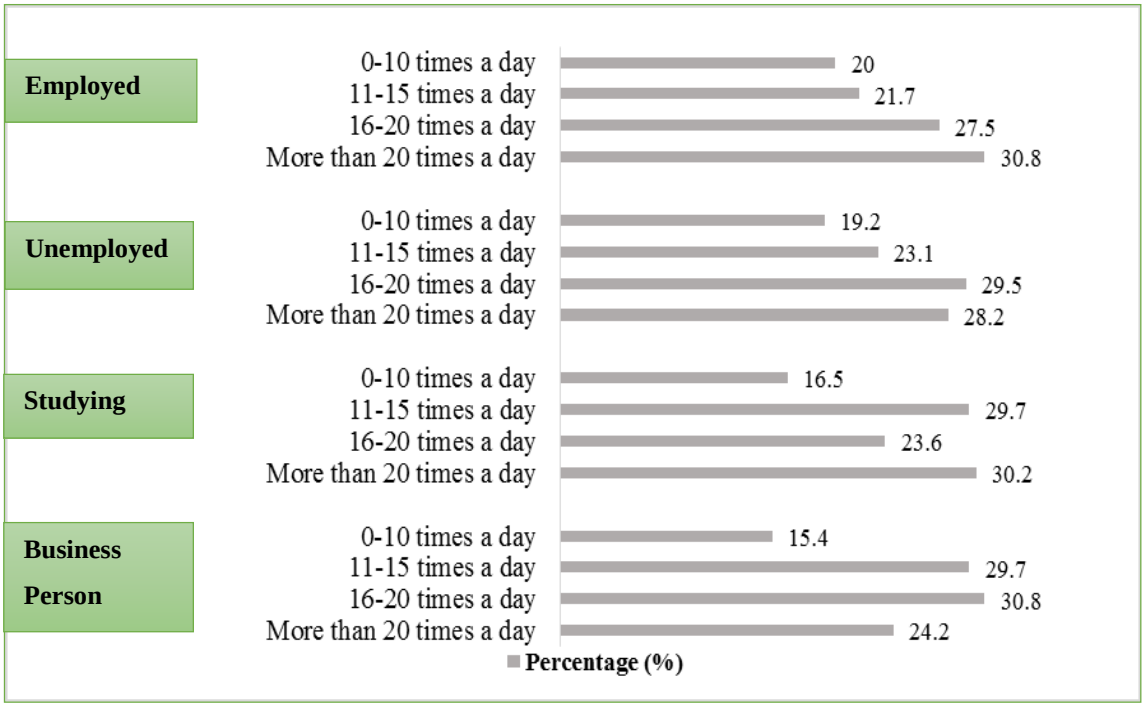


Chart 65. Public will be exposed to all surveillance as people may be observed through CCTV cameras daily (Mlt

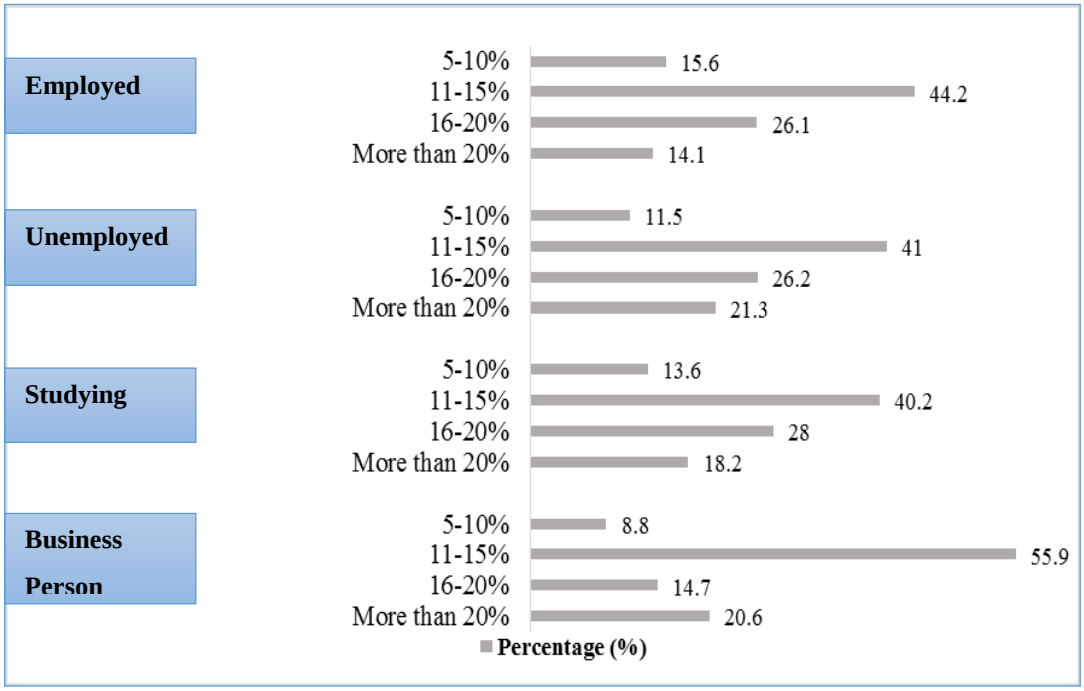


Chart 66. Annual reduction in Crime by surveillance through CCTV cameras (Rwp)

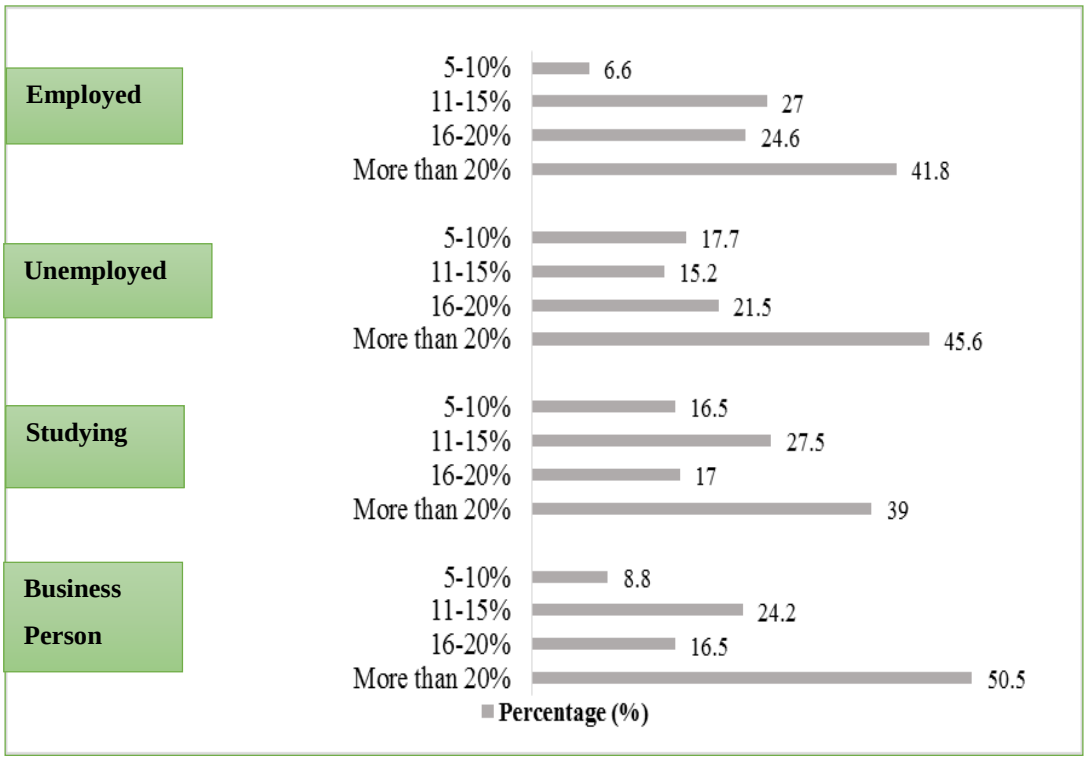


Chart 67. Annual reduction in Crime by surveillance through CCTV cameras (Mlt)

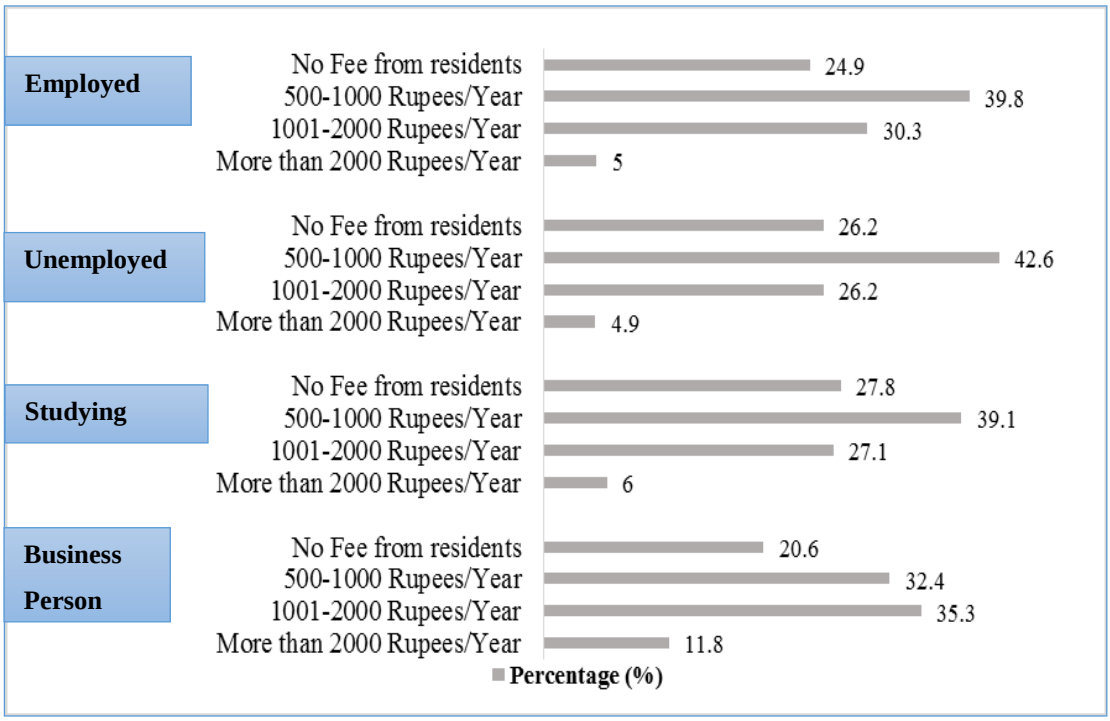


Chart 68. Annual Security Fee from residents of the City may be charged for programme (Rwp)

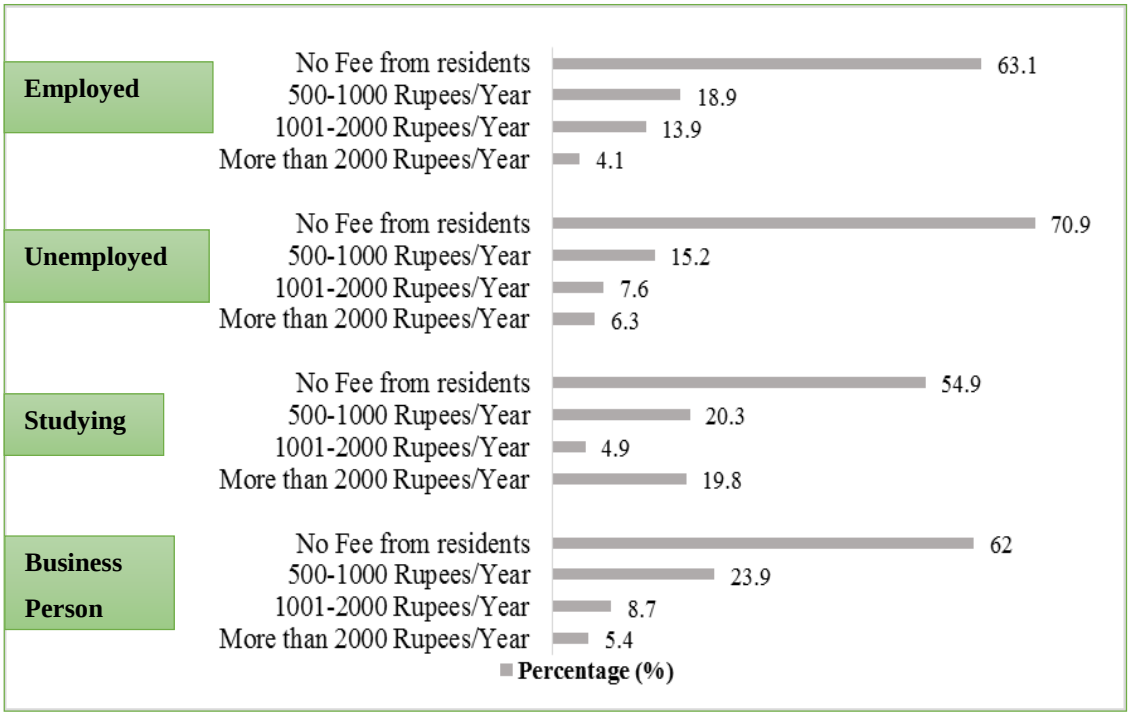


Chart 69. Annual Security Fee from residents of the City may be charged for programme (Mlt)

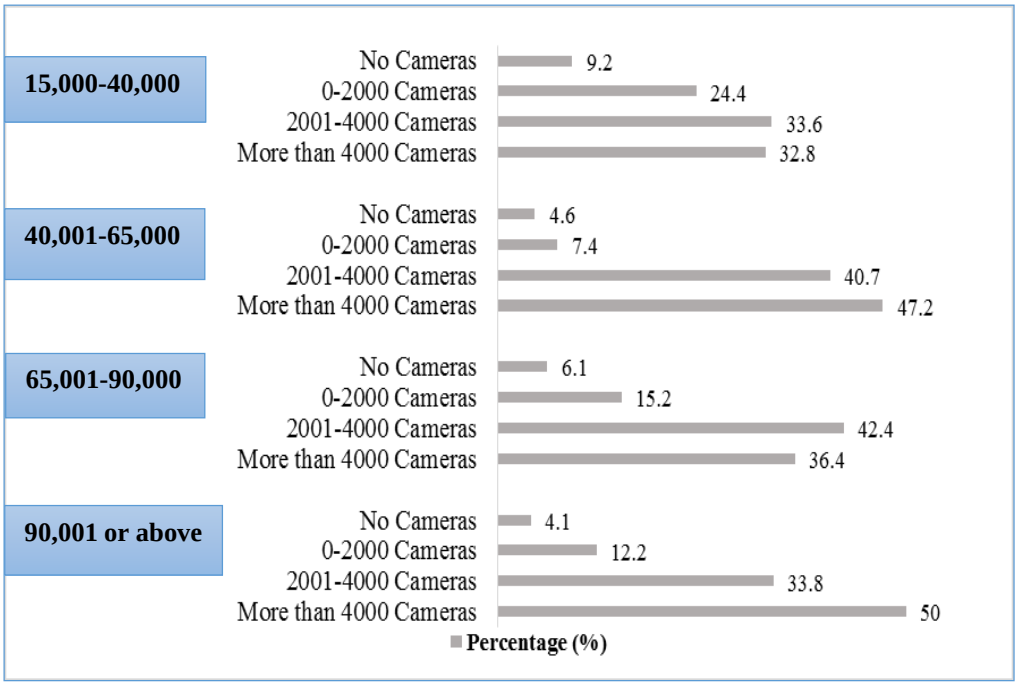


Chart 70. Proposed number of Cameras (Rwp)

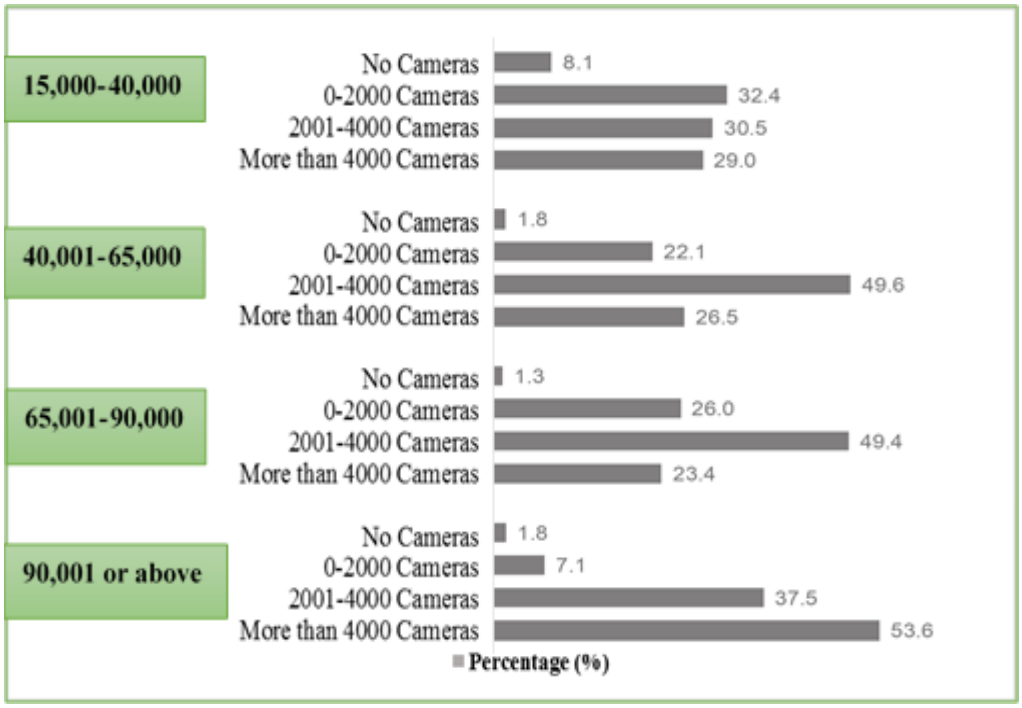


Chart 71. Proposed number of Cameras (Mlt)

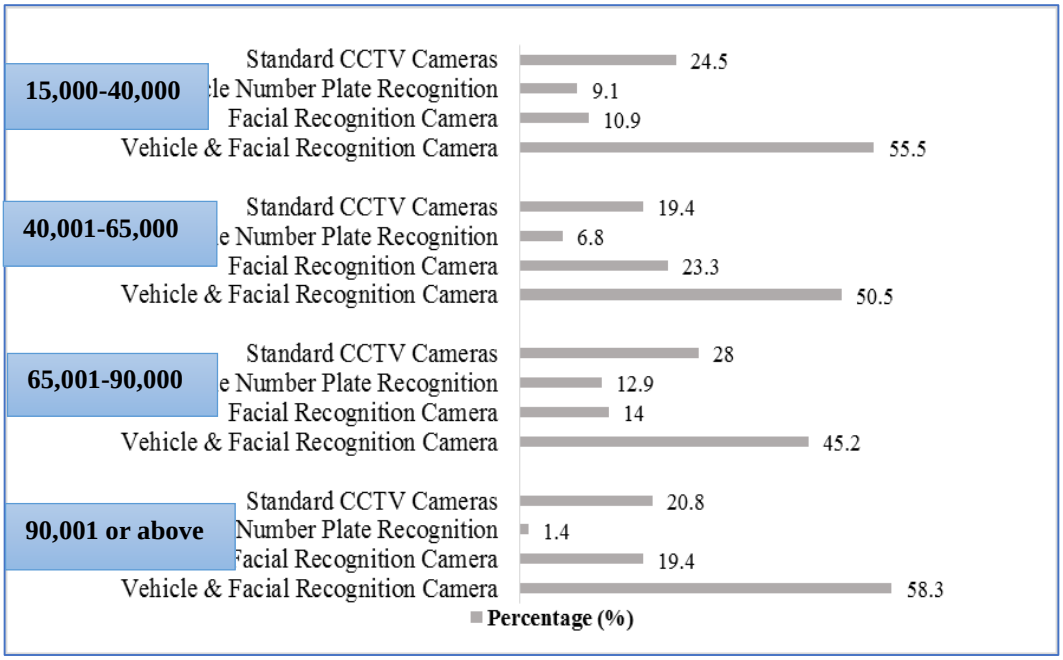


Chart 72. Types of Cameras in the City (Rwp)

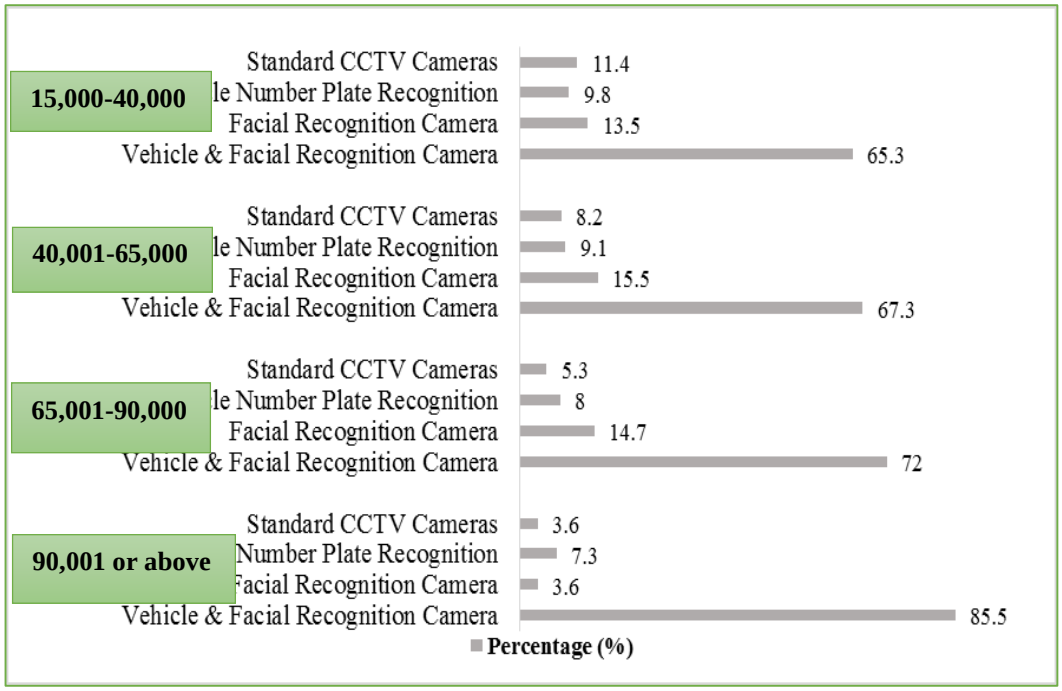


Chart 73. Types of Cameras in the City (Mlt)

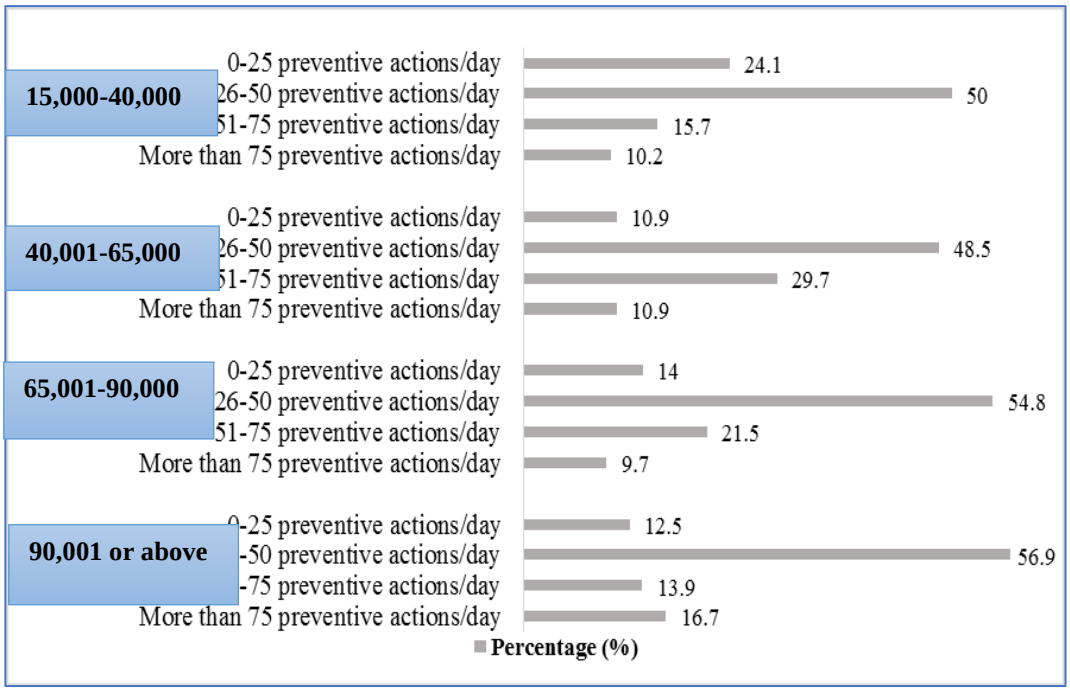


Chart 74. Probability of Preventive Action taken against suspicious activity BEFORE any incident/potential crime by the Police with the help of CCTV cameras (Rwp)

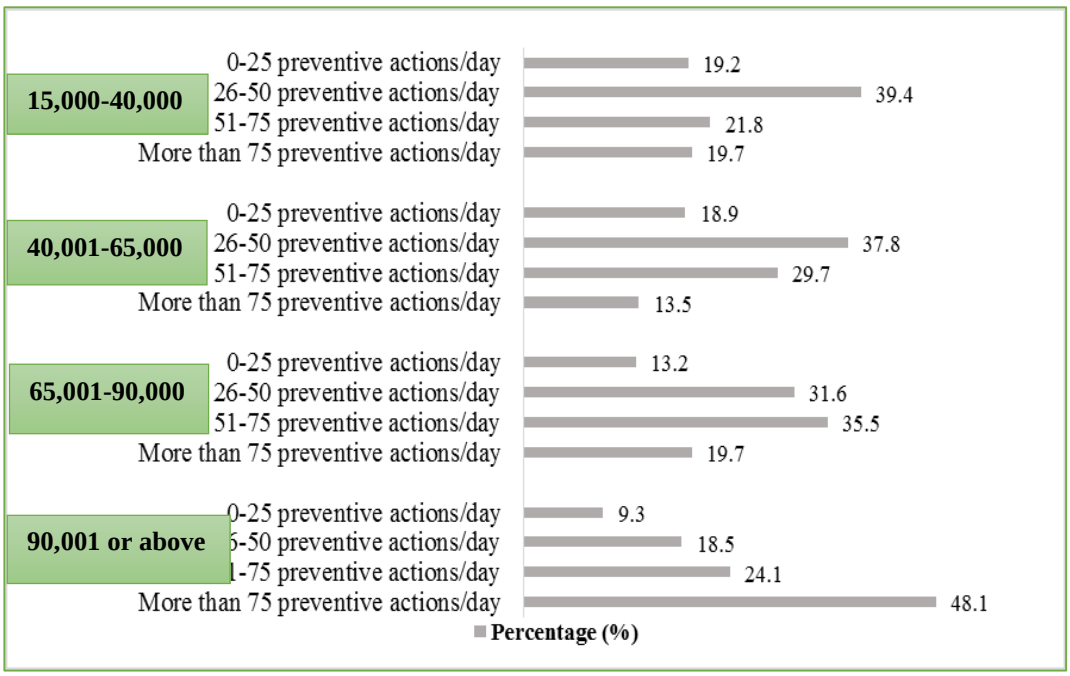


Chart 75. Probability of Preventive Action taken against suspicious activity BEFORE any incident/potential crime by the Police with the help of CCTV cameras (Mlt)

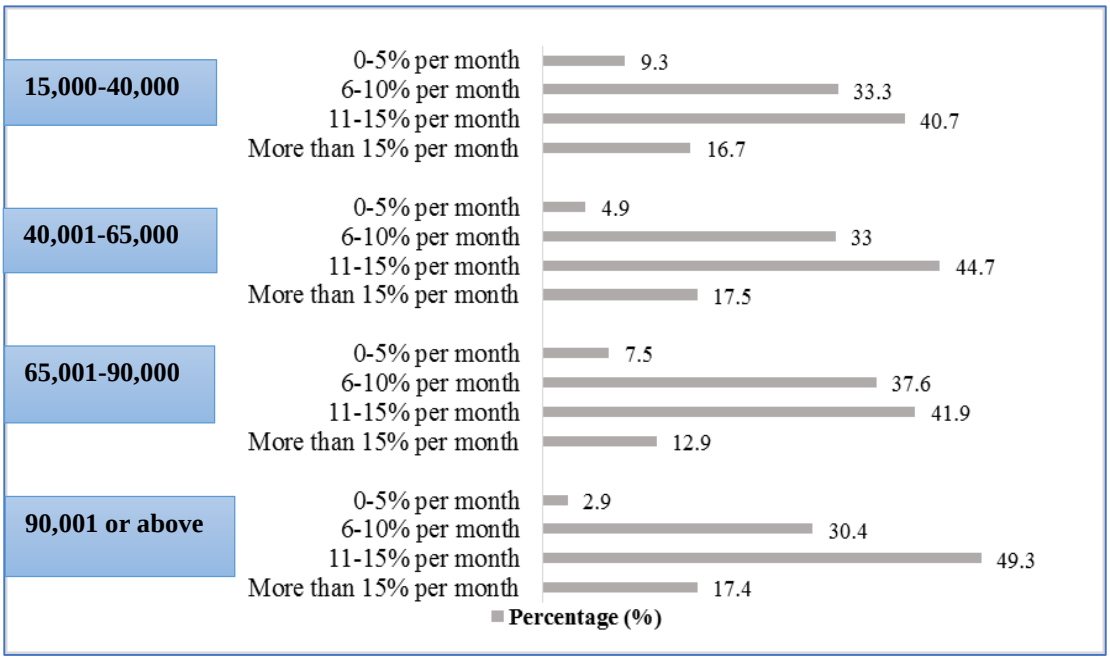


Chart 76. Percentage of crimes/cases resolved AFTER the crime/incidents by the Police with the help of CCTV cameras every month (Rwp

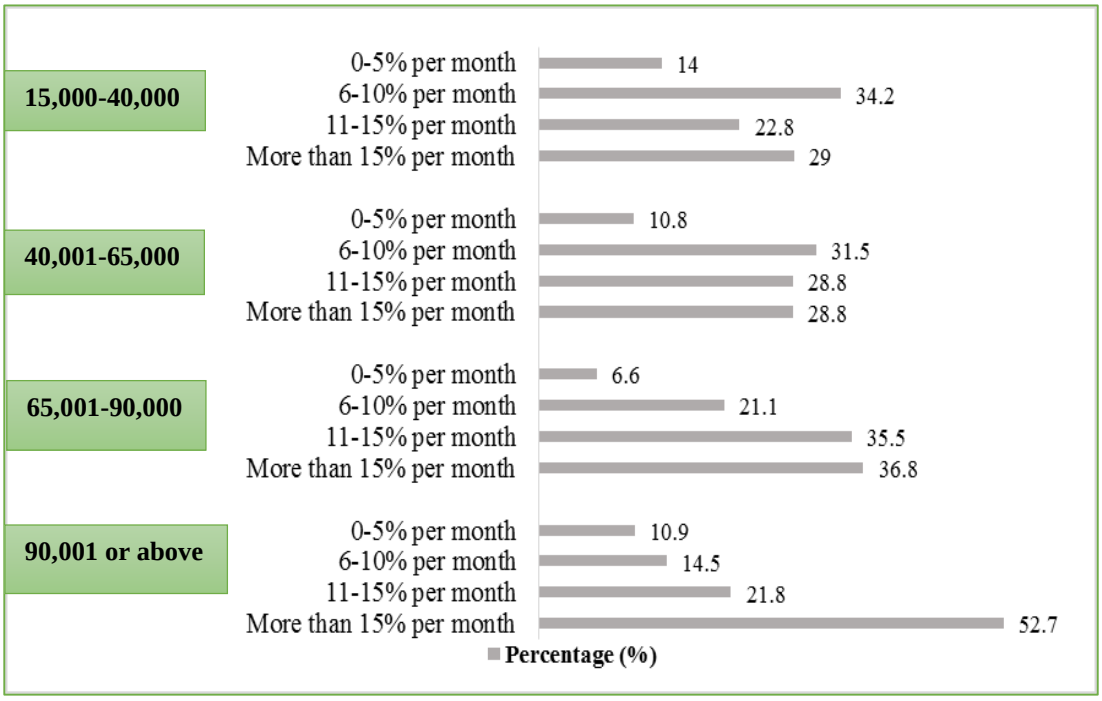


Chart 77. Percentage of crimes/cases resolved AFTER the crime/incidents by the Police with the help of CCTV cameras every month (Mlt)

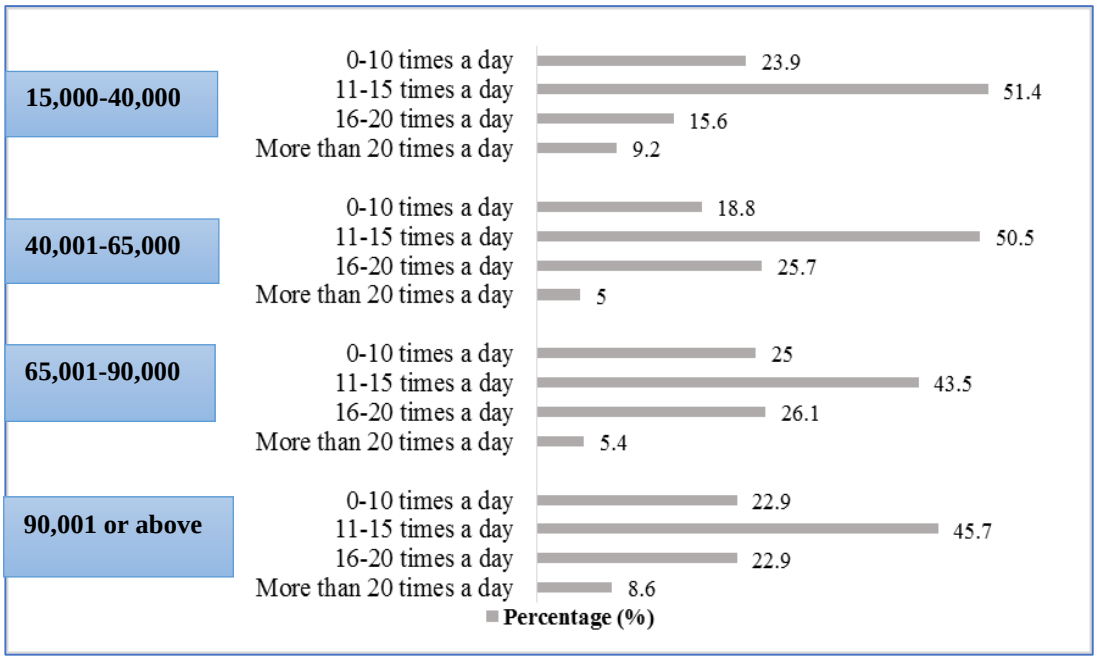


Chart 78. Public will be exposed to all surveillance as people may be observed through CCTV cameras daily (Rwp)

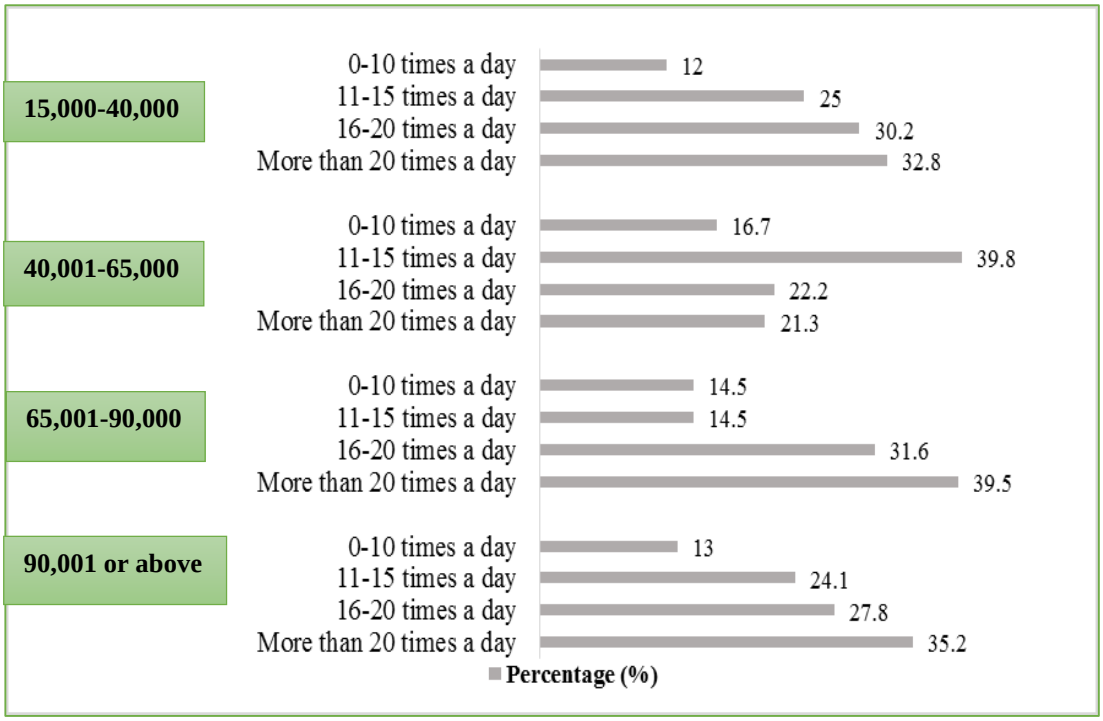


Chart 79. Public will be exposed to all surveillance as people may be observed through CCTV cameras daily (Mlt)

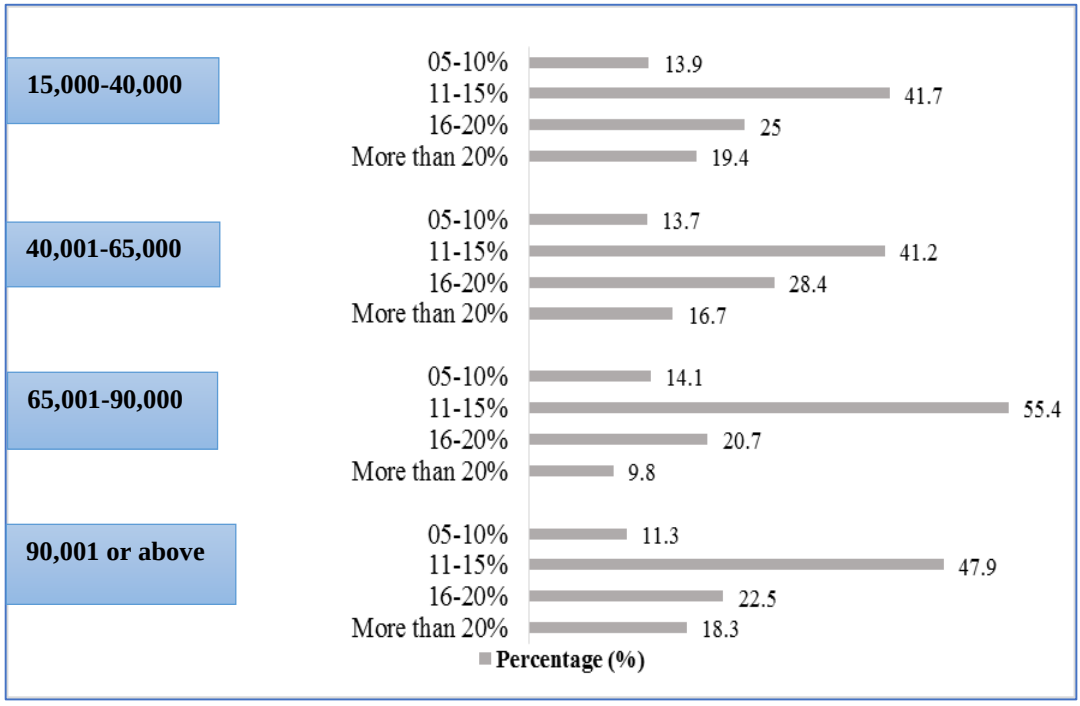


Chart 80. Annual reduction in crime by surveillance through CCTV cameras (Rwp)

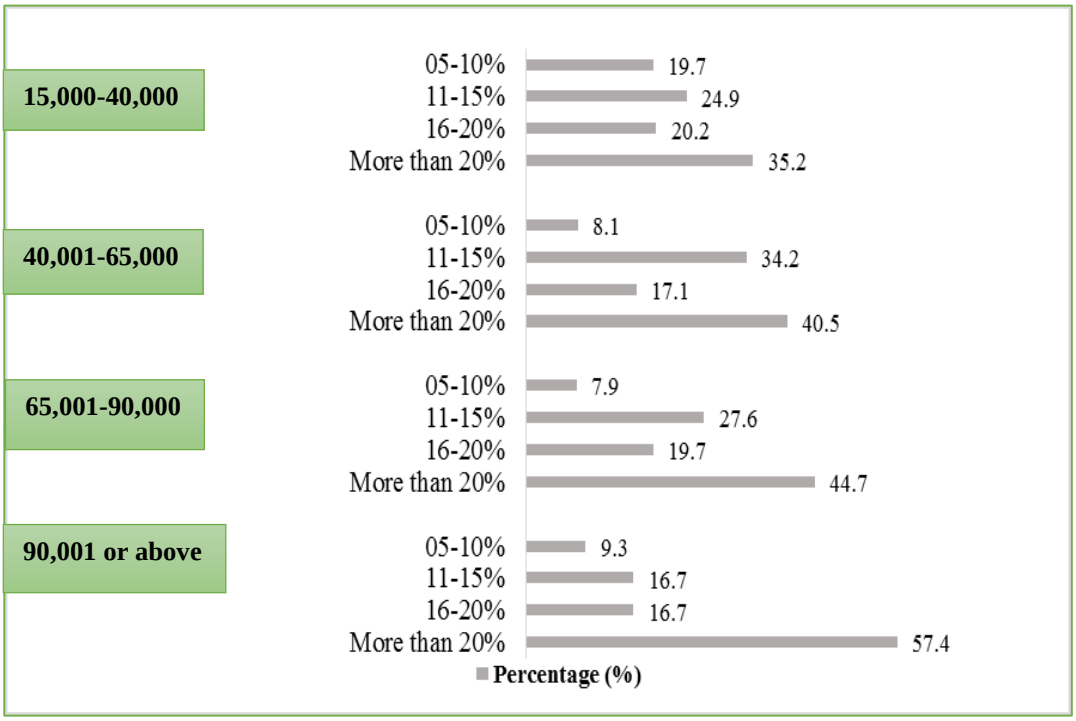


Chart 81. Annual reduction in crime by surveillance through CCTV cameras (Mlt)

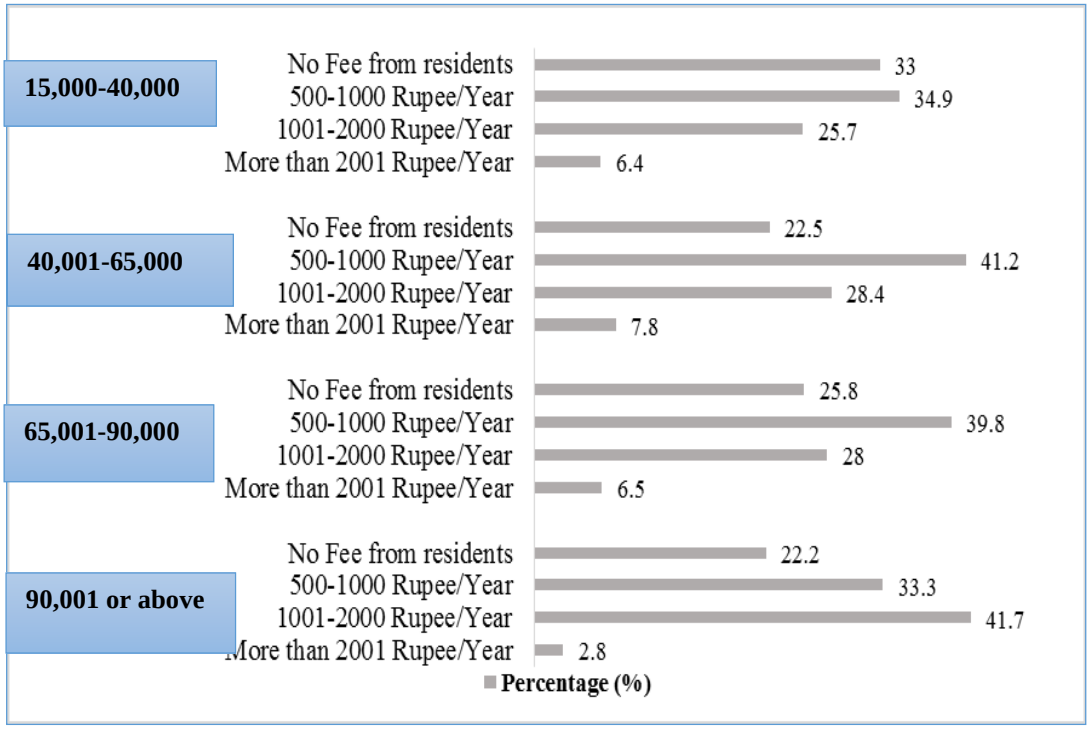


Chart 82. Annual *Security Fee* from residents of the city may be charged for the programme (Rwp)

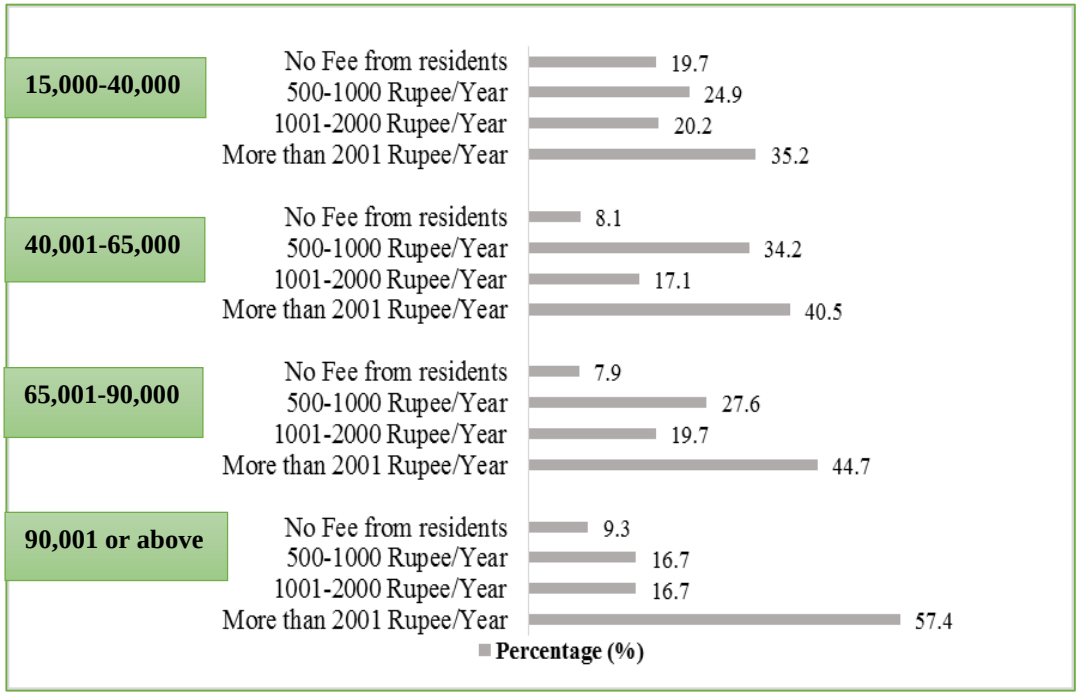


Chart 83. Annual *Security Fee* from residents of the city may be charged for the programme (Mlt)

Annexure – XXII

Approved Survey Questionnaire by Ethics Committee

UNIVERSITY OF PORTSMOUTH

FAVOURABLE ETHICAL OPINION

Study Title: Public Preferences on the trade-off between privacy and surveillance in Public spaces

Reference Number: BAL/2019/7/Khan

Date Resubmitted: 01/07/2019

Thank you for resubmitting your application to the Faculty Ethics Committee and for making the requested changes/ clarifications.

I am pleased to inform you that the Faculty Ethics Committee was content to grant a favourable ethical opinion of the above research on the basis described in the submitted documents listed at Annex A, subject to standard general conditions (*See Annex B).*

Please note that the favourable opinion of the Faculty Ethics Committee does not grant permission or approval to undertake the research/ work. Management permission or approval must be obtained from any host organisation, including the University of Portsmouth or supervisor, prior to the start of the study.

Wishing you every success in your research

Peter Scott, Chair of the Faculty of Business and

Law Ethics Committee

Annexes

A - Documents reviewed

B - After ethical review

ANNEX A **Documents reviewed**

The documents ethically reviewed for this application

Document	*Version*	*Date*
Application form	1	26/02/2019
Application form	2	18/03/2019
Application form	3	13/05/2019
Application form	4	29/06/2019
Consent Form(s) (list if necessary)	1	16/03/2019
Consent Form(s) (list if necessary)	2	05/04/2019
Consent Form(s) (list if necessary)	3	18/06/2019
Supervisor Email Confirming Application	1	05/04/2019
Survey Instrument	1	05/04/2019
Script for Oral Consent	1	05/04/2019
Script for Oral Consent	2	30/04/2019
Script for Oral Consent	3	29/06/2019
Questionnaire	1	16/03/2019

ANNEX B - After ethical review

1. This Annex sets out important guidance for those with a favourable opinion from a University of Portsmouth Ethics Committee. Please read the guidance carefully. A failure to follow the guidance could lead to the committee reviewing and possibly revoking its opinion on the research.

2. It is assumed that the work will commence within 1 year of the date of the favourable ethical opinion or the start date stated in the application, whichever is the latest.

3. The work must not commence until the researcher has obtained any necessary management permissions or approvals – this is particularly pertinent in cases of research hosted by external organisations. The appropriate head of department should be aware of a member of staff's plans.

4. If it is proposed to extend the duration of the study beyond that stated in the application, the Ethics Committee must be informed.

5. Any proposed substantial amendments must be submitted to the Ethics Committee for review. A substantial amendment is any amendment to the terms of the application for ethical review, or to the protocol or other supporting documentation approved by the Committee that is likely to affect to a significant degree:

(a) the safety or physical or mental integrity of participants
(b) the scientific value of the study
(c) the conduct or management of the study.

5.1 A substantial amendment should not be implemented until a favourable ethical opinion has been given by the Committee.

6. At the end of the work a final report should be submitted to the ethics committee. A template for this can be found on the University Ethics webpage.

7. Researchers are reminded of the University's commitments as stated in the Concordat to

Support Research Integrity viz:

- maintaining the highest standards of rigour and integrity in all aspects of research
- ensuring that research is conducted according to appropriate ethical, legal and professional frameworks, obligations and standards
- supporting a research environment that is underpinned by a culture of integrity and based on good governance, best practice and support for the development of researchers
- using transparent, robust and fair processes to deal with allegations of research misconduct should they arise
- working together to strengthen the integrity of research and to reviewing progress regularly and openly.

8. In ensuring that it meets these commitments the University has adopted the UKRIO Code of Practice for Research. Any breach of this code may be considered as misconduct and may be investigated following the University Procedure for the Investigation of Allegations of Misconduct in Research. Researchers are advised to use the UKRIO checklist as a simple guide to integrity.

Bibliography

Abhirup Khanna, R. G. (2018). Intelligent Traffic Management System for Smart Cities.

Ahmad, R. (2019). Pakistanis Are Pissed Off About Their Privacy After Images Of Private Moments In Cars Were Leaked Last Night. Lahore: Mangobaaz.com.

Alessandro Acquisti, R. G. (2009). Predicting Social Security numbers from public data. *PNAS, 106*(27), 10975-10980.

Ali, A. (2019). Facebook, Amazon and Google are accused of abusing user information, here's how. Digital Information World.

Ali, S. A. (2020). Reorganizing the commission. International-The News.

Ammad Javed Khan, W. A. (2019). Capacity Development Challenges in the way . Islamabad: Sustainable Development Policy Institute .

Anwar, B. (2018). Lahore to become the first safe city in South Asia in 2018. Lahore.

Ashraf M. Esmail, J. P. (2012). The Impact of Culture on Crime. *Jstor, 20*, 326-343.

Chettiar, I. M. (2018). *Sexual Assault Remains Dramatically Underreported.*

Choudhary, M. (2019). What is Intelligent Transport System and how it works? geospatialworld.net.

Cîrdei, I. A. (2019). The Impact of Globalization on the Security Environment. *Research Gate*, 40-46.

Collins, H. (n.d.). *Collins*. Retrieved from https://www.collinsdictionary.com/dictionary/english/traffic-offence

Daniyal Hassan, S. M. (2017). Suicide Bomber Kills 13 at Protest in Lahore, Pakistan. Lahore: Newyork Times.

David Sheperdson. (2019, July 24). *Facebook faces $5 billion fine over privacy violations*. Retrieved November 20, 2020, from Reuters: https://www.reuters.com/article/us-facebook-ftc/facebook-to-pay-record-5-billion-us-fine-over-privacy-faces-antitrust-probe-idUSKCN1UJ1L9

Descant, S. (2018). Change Management Key to Smart Cities.

Digital Rights Foundation. (n.d.). *Help making the internat safer & more accessible*. Retrieved from Digital Rights Foundation: https://digitalrightsfoundation.pk/

Doyle, J. (2015). Emergency Service Response Times .

Duignan, B. (2001, October 24). *USA PATRIOT Act*. Retrieved March 22, 2018, from Britannica: https://www.britannica.com/topic/USA-PATRIOT-Act

Frankenfield, J. (2019, August 29). *Behavioral Analytics*. Retrieved December 7, 2019, from Investopedia: https://www.investopedia.com/terms/b/behavioral-analytics.asp

Freude, A. F. (2016, October 1). *Echoes of History: Understanding German Data Protection*. Retrieved Feburary 19, 2018, from Bertelsmann Foundation: https://www.bfna.org/research/echos-of-history-understanding-german-data-protection/

Gabol, I. (2017). Senior Police officers among 13 killed as suicide bomber strikes Lahore. Lahore: Dawn.com.

Garner, B. A. (n.d.). In 9 (Ed.), *Black's Dictionary* (p. 430). A Thomson Reuters business.

Garner, B. A. (n.d.). *Black's Law Dictionary* (9th ed.). A Thomson Reuters business.

Haider, M. (2018). Cabinet to consider security of bureucrats tenure. International-The News.

Halan, D. (June, 2019). How Intelligent Traffic Management Systems Enable Smarter Use of Transport Networks. electronicsforu.com.

Henry H. Willis, O. A.-S. (2014). *National Security Perspectives on Terrorism Risk Insurance in the United States.* RAND Corporation.

Henry H. Willis, O. A.-S. (n.d.). *National Security Perspectives on Terrorism Risk Insurance in the United States.* RAND Corporation.

Human Rights Watch. (2016). *This Crooked System - Police Abuse and Reform in Pakistan.* hrw.org.

Hüseyin Erol, I. D., & Guzide Atasoy, M. T. (2018). Contemporary Issues in Mega Construction Projects. 1022-1032.

Ikram, K. (2011). *Revitalizing the Planning Commission: some recommendations* . IGC-International Growth Centre.

India Today, New Delhi. (2017, February 13). *Pakistan: Suicide blast rocks Lahore's Mall Road, 16 including 2 senior cops killed*. Retrieved November 21, 2019, from India Today Webdesk: https://www.indiatoday.in/world/story/pakistan-lahore-blast-960506-2017-02-13

Internationa, P. (2019, January 26). *State of Privacy Pakistan*. Retrieved July 23, 2019, from Privacy International (PI): https://privacyinternational.org/state-privacy/1008/state-privacy-pakistan

International-The News. (2018). Street crime dropped in two months, claim police. Lahore.

Ismail, Z. H. (1999, December). Impediments to Social Development in Pakistan. *Research Gate, 38*(4), 717-738.

Janet Phillips, M. P. (2006). *Measuring domestic violence and sexual assault against women.* Malcolm Park, Analysis and Policy Statistics Section. ----: Parliament of Australia.

Javier Pallero, V. A. (2018, October 26). Your data used against you: reports of manipulation on WhatsApp ahead of Brazil's election. accessnow.org.

Johnson, R. R. (2012, January). Police Organizational Commitment: The Influence of Supervisor Feedback and Support. *Research Gate*.

Juneja, P. (2020, March 23). Pre-Requisites for Successful Change Management.

Khan, A. N. (2019, December 30). Surveillance, security and privacy. *Surveillance,Security & Privacy.* Lahore: The Nation.

Khan, R. (2019, December 02). Lahore is More Safer than London, Washington, and New York. *Lahore is More Safer than London, Washington, and New York*. Lahore, Punjab, Pakistan: Michni.

Khan, S. (2019, December 29). *Battling Orwellian surveillance*. Retrieved January 3, 2020, from The News International: https://www.thenews.com.pk/tns/detail/589543-battling-orwellian-surveillance

Khawar, H. (2017, September 06). Lahore — world's largest city in 2050. *Largest City*. Lahore, Punjab, Pakistan: The Express-Tribune.

Kirchgaessner, S. (2020, January 22). *Jeff Bezos Hack: Amazon Boss's phone' hacked by Saudi crown prince'*. Retrieved June 12, 2020, from The Guardian: https://www.theguardian.com/technology/2020/jan/21/amazon-boss-jeff-bezoss-phone-hacked-by-saudi-crown-prince

Llopis, G. (2014, June 09). *Every Leader Must Be A Change Agent Or Face Extinction*. Retrieved March 25, 2019, from Flipboard: https://flipboard.com/@forbes/every-leader-must-be-a-change-agent-or-face-extinction/

M.B.Chande. (1997). Crime Situation. In *The Police in India* (pp. 520-522). Atlantic Publisher & District.

MacAskill, E. (2019, September 13). *Edward Snowden in Russian Exile;" You have to be ready to stand for something"*. Retrieved April 08, 2020, from The Guardian: https://www.theguardian.com/us-news/ng-interactive/2019/sep/13/edward-snowden-interview-whistleblowing-russia-ai-permanent-record

MacCarthy, M. (2018, August 14). *Online manipulation is the latest data protection debate*. Retrieved January 26, 2020, from CIO: https://www.cio.com/article/3297536/online-manipulation-is-the-latest-data-protection-debate.html

Martin R. Huecker, W. S. (2019). *Domestic Violence.* NA: NCBI.

McNeal, G. (2014, November 01). *Drones & Aerial Surveillance: Consideration for Legislature.* Retrieved July 04, 2017, from Brookings: https://www.brookings.edu/research/drones-and-aerial-surveillance-considerations-for-legislatures/

M-Dyaa Albakour, C. M. (2014). Information Access in Smart Cities. *Springer Link*, 810-811.

Merlin Stone, J. K. (2018). Information management in the smart city. *Researchgate*, 357-367.

Meyar, D. (2019, January 28). *Google and Ad Industry Accused of "Massive" Abuse of Intimate Personal Data*. Retrieved 11 2019, December, from Fortune: https://fortune.com/2019/01/28/google-iab-sensitive-profiles/

Mike Isaac, S. F. (2018, September 29). *Facebook Security Breach Exposes Accounts of 50 Million Users*. Retrieved May 24, 2019, from Tech Crunch: https://techcrunch.com/2018/09/28/everything-you-need-to-know-about-facebooks-data-breach-affecting-50m-users/

Mirza, N. H. (2018, September 23). *Lahore traffic police kick-start e-challan system for violators*. Retrieved July 21, 2019, from Research Snipers: https://www.researchsnipers.com/lahore-traffic-police-started-e-challan-system-for-violators/

Mladen. (2009, NA NA). *Current Traffic Index*. Retrieved January 11, 2020, from Numbeo: https://www.numbeo.com/traffic/rankings_current.jsp

National Research Council. (2007). *Engaging Privacy and Information Technology in a Digital Age.* NA: 2020 National Academy of Sciences.

Naya Daur. (2019, january 21). *People are disgusted as private pictures of passengers leaked allegedly by Safe City authorities*. Retrieved October 24, 2019, from Naya Daur: https://nayadaur.tv/2019/01/people-disgusted-as-private-pictures-of-passengers-leaked-allegedly-by-safe-city-authorities/

Newman, L. H. (2018, September 28). *Everything We Know About Facebook's Massive Security Breach*. Retrieved July 2019, from Wired: https://www.wired.com/story/facebook-security-breach-50-million-accounts/

Nurul Nuha Abdul Molok, S. C. (2012, March). Information Leakage through Online Social Networking: Opening the Doorway for Advanced Persistence Threats. *Research Gate*, 70-80.

Odlyzko, A. (2003). Privacy, Economics, and Price Discrimination on the Internet. *SSRN*, 355-366.

One Trust. (2018, October 02). What is the Pakistan Data Protection Bill 2018? onetrust.com. Retrieved from https://www.onetrust.com/what-is-the-pakistan-data-protection-bill-2018/

ORDER, Q.-E.-S. (1984). 164. Production of evidence that has become available because of modern devices, etc.

Oxford Bibliographies.com. (2015). Retrieved from https://www.oxfordbibliographies.com/view/document/obo-9780195396607/obo-9780195396607-0019.xml

PPIC3 Centre Programme. (2015). *Concept Paper.* Lahore: Punjab Safe City Authority .

PSCA. (2019). *5th Annual Report.* Lahore.

Punjab Safe Cities Authority. (2019). *Data & Privacy Protection Procedures (DP3).* Lahore, Pakistan: Punjab Safe Cities Authority.

Punjab Safe Cities Authority. (2019, December 22). PSCA Privacy Policy. *PSCA*. Lahore, Punjab, Pakistan. Retrieved from https://www.psca.gop.pk/PrivacyPolicy/Index

Randol, M. A. (2010). *The Department of Homeland Security Intelligence Enterprise: Operational Overview and Oversight Challenges for Congress.* Congressional Research Service.

Report, B. (2020, January 22). *Work on Safe City Project for Peshawar to start soon*. Retrieved January 26, 2020, from The News: https://www.thenews.com.pk/print/602460-work-on-safe-city-project-for-peshawar-to-start-soon

Sanderijn Cels, J. d. (2012). *Agents of Change - Strategy and Tactics for Social Innovation.* Brookings Institution Press/Ash Center.

Shaw, J. (2017, January-February). *The Watchers.* Harvard Magazine.

Sheikh, N. (2019, April 03). Technology effectively helping police combat crime in Lahore. Lahore: The Express - Tribune.

Solon, O. (2019, October 03). Facebook faces $1.6bn fine and formal investigation over massive data breach. *Facebook*. San Francisco: The Guardian.

South Asian Terrorism Portal Index. (2019, January 01). *South Asian Terrorism Portal Index*. Retrieved March 03, 2020, from SATP: https://www.satp.org/satporgtp/countries/pakistan/database/casualties.htm

Strom, K. (2017). Research on the Impact of Technology on Policing Strategy in the 21st Century, Final Report. *Research Gate*, 50-67.

Sukhera, N. (2017, January 12). *Integrated Traffic Management System – 'Key to Lahore's Traffic Woes'*. Retrieved January 20, 2020, from MIT, Technology Review: http://www.technologyreview.pk/integrated-traffic-management-system-key-lahores-traffic-woes/

The Express-Tribune. (2016, October 12). *First phase initiated: Safe City comes to life in Lahore*. Retrieved December 19, 2019, from Tribune: https://tribune.com.pk/story/1197323/first-phase-initiated-safe-city-comes-life-lahore/

The Nation. (2017). Traffic Police introduce Digital-Ticketing. Lahore.

The Nation. (2019, August 22). *British, Japanese police officers visit PSCA*. Retrieved August 24, 2019, from The Nation: https://nation.com.pk/22-Aug-2019/british-japanese-police-officers-visit-psca

The National Academy of Sciences, Engineering & Medicine. (2019). *A decadal survey of the social and behavioral sciences: A research agaenda for advancing intelligence analysis.* Washington DC: NAP.

The News . (2018, January 05). *CM Shehbaz inaugurates Safe City Project in Lahore*. Retrieved June 18, 2020, from The News: https://www.thenews.com.pk/print/264763-shahbaz-inaugurates-lahore-safe-city-project

The Realities of Sexual Assault on Campus. (2017). Retrieved from https://www.bestcolleges.com/resources/preventing-sexual-assault/

Times of Islamabad. (2018, September 24). *E Challan: For the first time in the history of Pakistan, a modernised western system implemented*. Retrieved July 23, 2019, from Times of Islamabad: https://timesofislamabad.com/24-Sep-2018/e-challan-for-the-first-time-in-the-history-of-pakistan-a-modernised-western-system-implemented

Tobias Brandt, B. D. (2016). Information Systems and Smarter Cities: Towards an Integrative Framework and a Research Agenda for the Discipline. *Semantic Scholars*, 5-10.

Tomaszewski, E. (2018). *Addressing the Social and Cultural Norms That Underlie the Acceptance of Violence.* Washington (DC): National Academies Press (US).

U.S. Consulate General. (2019, July 02). *Pakistan 2019 Crime & Safety Report: Lahore*. Retrieved january 12, 2020, from OSAC: https://www.osac.gov/Content/Report/3a778e6b-0245-41bf-b1c4-1629afe3cf0d

UN Women. (2019, November 24). *A staggering one-in-three women, experience physical, sexual abuse*. Retrieved Feburary 07, 2020, from UN News: https://news.un.org/en/story/2019/11/1052041

Wessing, T. (2019). Violation of Data Protection Law as a Violation of Competition Rules - The Facebook Decision and New Trends in Case Law. Germany: Lexology.

Whittaker, Z. (2019, January 04). *Hackers leak data on Angela Markel and Hundreds of German lawmakers*. Retrieved May 07, 2019, from Techchrunch: https://techcrunch.com/2019/01/04/germany-data-breach-lawmakers-leak/

William D. Eggers, J. S. (n.d.). Pre-Requisites for Successful Change Management.

Williams, J. (2017). *Crimes Against Property: Definition, Cases & Examples*.

World Health Organization. (2009, January 01). *Changing cultural and social norms that support violence*. Retrieved March 09, 2019, from WHO Int.: https://apps.who.int/iris/handle/10665/44147

Zehnder, A. S. (2010). Camera Surveillance as a Measure of Counterterrorism? *Research Gate*, 01-16.

Zhang, L. (2018). *Intelligent Traffic Systems: Implementation and What's Down the Road?* Sector Insights, Transportation.

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